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Iodine in Nutrition*

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FOR more than 25 centuries it has been known that there was something in certain marine products that exercised a specific influence upon the thyroid gland. The Chinese, Phoenicians, Greeks, Romans and other peoples who had acquired an advanced degree of civilization all appear to have been in possession of this information. It was not known until Davy discovered it in 1815, that the efficacy of burnt sponges and other marine products was due to the presence of iodine, an element discovered by Courtois in 1811. In 1820 Coindet, a physician in Geneva, suggested that the beneficial effect on goiter of these marine products might be due to the iodine they contained. He conducted experiments upon goiter patients by administering tincture of iodine, with the result that the goiters disappeared. He observed, however, that certain of these patients manifested toxic symptoms and consequently he concluded that this method of treatment should be closely supervised. Among those who were investigating the treatment of goiter about this time and by whom its dangers had been observed was d'Espine, who estimated that the minimum curative dose was 0.5 mg. per day.

During this period the subject was studied from several different points of view and considerable information was accumulated that suggested the connection between iodine deficiency and goiter. Angeline in 1824, and Cantu in 1825, found iodine in certain springs which had a reputation for the cure of goiter. A few years later Boussingault observed that the sea salt of Gauca exercised a decidedly beneficial influence in the prevention of goiter in the people of the Andes where goiter was very common.

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In 1849 Prévost suggested that goiter was due to a deficiency of iodine and bromine in drinking water. He suggested that when iodine was present in salt it gave protection against goiter.

Between 1850 and 1854 Professor Chatin of Paris made very extensive investigations. Following these he announced that where the soils and waters were relatively high in iodine goiter was unusual, but when low in their iodine content many cases of goiter and cretinism were observed. Chatin's views were severely criticized for a period covering several years, but his basic observations have become so firmly established and have been so often confirmed, both in Europe and this country, that we may safely conclude that they are correct. Among those who have studied Chatin's observations is McClendon of the University of Minnesota. His investigations were most extensive and agree in practically every detail with Chatin's findings.

Among others whose investigations led to definite conclusions was Lombroso, who recommended that all marriageable individuals residing in goiter areas should be treated with iodine for the prevention of cretinism. I believe it was he who first recommended the use of iodine in the treatment of farm animals in goiter areas, a measure that has been largely adopted and which has resulted in saving from ruin the live stock industries in those areas.

Probably the first to suggest the use of iodine in salt as a routine measure of treatment in the prevention and cure of goiter was Koestl, who in 1855 began its use in Austria.

In practically all of the goiter areas of Europe there occurred a wave of enthusiasm for the use of some form of inorganic iodine in the treatment and prevention of goiter. It appears that a most indiscriminate use of the various iodine preparations was indulged in with many instances of poisoning.

It was not until 1860 when Rilliet presented to the French Academy of Medicine a classical description of the toxic symptoms which follow over-dosage of iodine that medical men began seriously to consider their error. Following the widespread circulation of Rilliet's report the administration of so-called inorganic iodine began to be considered by many as dangerous and by others as either impractical or ineffective. It may be pertinent to mention here that so thoroughly did Rilliet consider his subject that although it was presented 70 years ago, no one since has presented nearly so comprehensive a report. It would be well if each physician residing in the vast goiter area of this country would familiarize himself with it.

Iodine is widely distributed in nature but is present in small and variable quantities in both organic and inorganic substances. The

air, water, soils, rocks, mineral ores and marine products have for many years been considered the most important sources of iodine. Within the last few years McClendon[1] has called attention to vegetables grown in certain sections as being of great value in the prevention and treatment of goiter. In the past 2 years Remington[2] has analyzed hundreds of samples of vegetables and as a result of his work the subject has been greatly advanced.

The amount of iodine in the air is extremely variable. Gautier[3] found approximately 16 times as much iodine in the air at the seashore as in Paris. However, von Fellenberg found that the amount of iodine in the air varies greatly in the same locality and is subject to such influences as rain, dews, altitude, and the presence of large amounts of soot.

The amount of iodine present in drinking waters is, generally speaking, of little consequence when considered in its individual relationship as a reliable source to supply the bodily requirements. However, certain springs in France and Austria are said to contain a sufficient amount of iodine to prevent goiter. Investigators, both in this country and Europe, report a very much greater amount in the water from the non-goitrous areas than in those where the goiter incidence is high. McClendon[4] found that drinking water in the lower Mississippi Valley contains 100 to 1,000 times more iodine than that in the basin of the Great Lakes. In the former district there is practically no goiter, while in the latter from 35 to 60 per cent of the children are so afflicted. Chatin estimated the amount of iodine in 300 rivers. Perhaps his most important conclusion was that water from sources rich in lime and magnesium and from melting glaciers are invariably low in iodine.

Hercus, Benson and Carter[5] analyzed the water from 3 New Zealand rivers with the following results: the Clutha was iodine free, the Taiere contained 1 microgram and the Leith 2 micrograms per liter.

Mitchell[6] found a wide variation in the iodine content of the different rivers in South Carolina. In the Seneca River he found 1.86 parts per billion and in the Broad 6.53 parts per billion. It is interesting to note that water taken from these rivers and subjected to treatment by chemicals and filtration resulted in a loss of iodine of from 30 to 70 per cent.

Sea water from the several oceans has been analyzed by von Fellenberg, Blyer, Heymann, McClendon and others. These waters show remarkable variation which cannot be accounted for by differences of method, because von Fellenberg[7] found that the water from the Mediterranean contained 17 micrograms per liter, while that at

Biarritz contained 57 micrograms per liter. Although seaweed and plankton concentrate enormous amounts of iodine, the opinion which prevails that the sea is our chief source of iodine is fallacious. Soils in many places contain a greater amount of iodine than does the sea. The richest deposits are in Chile.

Iodine is present in the various metal ores and is relatively rich in some of the copper and iron ores. It does not, however, appear to have any special affinity for any metal.

OCCURRENCE OF IODINE IN THE BODY

It is difficult to state in exact terms the total quantity of iodine found in the body ash, because of certain influences, such as locality, sex, age and season. A much greater amount is found in those residing in non-goitrous areas than in those where goiter is common.

Age[8] also seems to exercise an important influence. At birth practically no iodine is found in the thyroid gland and after the first 3 or 4 months the quantity seems to increase up to puberty. There is a slightly greater amount in the bodies of women than men, and a number of authors have noted a marked seasonal variation in this country.

The total quantity of iodine in the body of the average adult has been variously estimated by Lunde, Class,[9] Wulfert, Justus, Sturm, von Fellenberg and others. On the average of these we may estimate it at 51 mg. Of this 25 mg. are in the musculature, 10 mg. in the thyroid, and the remainder in small proportions in the spleen, suprarenals, salivary glands, the bones, skin and blood. Certain American investigators report that the thyroid gland contains almost half of the total body iodine. This matter is largely or entirely determined by the iodine content of the diet.

IODINE REQUIREMENT

Since 1896 when the German chemist Baumann discovered the presence of iodine in the normal thyroid gland, much work has been done by chemists in Europe and America to determine the actual amount required by the body. We must remember that iodine is in constant circulation in the blood and that we have a normal iodine metabolism.

Lunde and Class[10] estimate the normal iodine concentration of the blood at 11 to 16 micrograms per 100 c.c. They estimate the amount necessary to meet all requirements of metabolism at around 0.05 mg. per day. In the presence of some infection or some increased physiological activity such as puberty, pregnancy, lactation or the menopause, a greater amount is required. A simple calculation will demon-

strate this, if taken in its organic relation, to be excessive, i.e., beyond nutritional requirement. It is my opinion that less than one-tenth of this amount is more than sufficient to prevent or cure incipient endemic goiter. It is also true that people living in areas where the diet supplies an adequate amount of iodine have smaller thyroid glands, but these contain a greater amount of iodine than those of people living in areas where the glands are larger.

IODINE IN NUTRITION

Concerning the physiological functions of iodine in nutrition—(1) Iodine furnishes the most important element which enables the thyroid gland to synthesize thyroxin. The thyroid gland contains 65 per cent of iodine. Thyroxin is the hormone which regulates the basal metabolic rate and determines the rate of function of all the glands in the body. (2) A sufficient amount of iodine in the diet of the mother increases the weight and growth of the young. It also makes the young strong and more apt to survive. (3) The iodine content of the ovaries and uterus is fairly high, especially when the diet is abundant in this element. When this is the case reproduction is favorably influenced. (4) A deficiency of iodine in the diet results in enlargement of the thyroid gland—goiter. (5) A deficiency of iodine in the diet results in frigidity, sterility and frequent miscarriage. (6) A lack of iodine extending over several generations gives rise to the birth of cretins, feebleminded children and congenital idiots, and in adults myxedema.

Lunde in Norway[11] and von Fellenberg in Switzerland, have independently undertaken studies to determine an accurate method of measuring the daily iodine intake. Both investigators assume that

TABLE I

School District	*Percentage of goiter among school children* (J. Nicolaysen)	*Micrograms Iodine in 24 hours* (G. Lunde)
Hostvedt	59.7	40
Hvittingfoss	55.0	48
Ljterud	54.0	29
Meheia	53.6	39
Saggrenda	43.0	64
Komnes	39.7	48
Berg	38.6	56
Eftett	36.6	65
Verp	36.0	87
Ruud	30.0	61
Vik i Sogn	0.0	173

1 microgram equals 0.001 mg.

regardless of where one resides he is in iodine equilibrium. They both found that approximately 60 per cent of the iodine intake was excreted in the urine. These experiments were conducted in high and low goiter areas and in those who had developed goiters and those who had not. Their results appear to be uniform and accurate (Table I).

I give von Fellenberg's figures for 3 Swiss provinces and for Forte dei Marmi on the Ligurian coast for the entire population (Table II).

TABLE II

	Percentage of goiter	*Micrograms Iodine per 24 hours*
Effingen	1.0	70
Kaisten	61.6	17
Hunzenschwiel	56.2	18
Forte dei Marmi	0.0	112

Among the most important factors that seem to interfere with the utilization of iodine in the system are a high fat or protein diet or both. Kendall[12] of Rochester, Minn., finds that of the total iodine of the thyroid gland 60 per cent is in the form of diiodo tyrosine, 16 per cent as thyroxine, and there is no inorganic iodine. This finding is significant and is in harmony with the increasing conviction of investigators that none of the chemical elements exercise an absolutely independent action. It is probable that elements other than iodine are concerned with it in the production of those manifestations that have heretofore been ascribed to iodine alone. In their work on nutritional anemia Myers and Beard[13] report that though copper supplements iron in hemoglobin regeneration, several other metals, among them germanium, arsenic, manganese and nickel, exercise a like influence.

There is constantly accumulating evidence that the inorganic form is not the method of supplying the necessary iodine, because it is of doubtful efficacy and apparently impractical. Resurveys following the use of iodized salt in Michigan for a period of several years have not shown the expected decrease in the incidence of goiter. The addition of iodine to drinking water has also proved disappointing.[14]

After a most diligent and careful search of the literature I have failed to find a single incidence of iodine poisoning where the diet contains an enormous amount of iodine in its organic state. Perhaps Lunde is correct in his explanation. He writes:

> Investigations have shown that when inorganic iodine is supplied it leaves the body quantitatively in a rather short time (less than 24 hours), mostly through the kidneys. The organically bound iodine of foodstuffs, however, is set free only

slowly in the organism, and a longer time elapses before it leaves the body. The question of the form in which iodine is utilized in the organism has not yet been solved; it is not known whether the organic compounds are first broken down so that the iodine can be disseminated in ionized form, or whether they are utilized directly. In any case it seems reasonable to assume that organic iodine compounds play an important part in the organism, since they are present in all tissues. A number of investigators have therefore emphasized the great importance of naturally bound iodine in goiter prophylaxis instead of the inorganic form.

Sufficient work has been done in the analyses of the various foods in the United States from which to select a diet that contains all the iodine that the body can utilize. It has been shown that sea fish contain a large though variable amount. The lean fish such as haddock, cod, coal fish and halibut has a high iodine content; herring and salmon may be considered as examples of fat fish and these have a much lower content. The shell and crustaceous fish possess a much higher iodine content than any other species, though, like other varieties, they differ tremendously.

The iodine content depends upon the available food supply. In some localities it is abundant, and in others scarce; consequently we find oysters that contain only 6,000 or 7,000 parts per billion, while others will range from 15,000 to 16,000.[15] Lunde[16] analyzed the oysters from Oslo Fjord and found that they had an unusually high iodine content. In that locality the plankton, which has the ability of concentrating an enormous amount of iodine, and upon which the oysters feed, was most abundant.

Clark[17] determined the iodine content of certain fish along the Massachusetts coast with the following results: soft shell clams 1,152 parts per billion, quahaugs 205, and cod 1,056. Remington[18] found that oysters from near Charleston contained 15,799 parts per billion.

As a result of a great number of analyses made by both McClendon and Remington[19] we are enabled to select vegetables, either canned or fresh, that contain relatively enormous amounts of iodine. The latter found spinach grown in South Carolina that contained from 800 to 1,200 parts per billion on the dry basis, and lettuce of like value; also that beans, asparagus, carrots, and other vegetables grown in the same state were extremely rich in iodine.

It is the feeling of pediatricians in an extensive section of the country that goiter is distinctly on the increase in young children. This observation suggested the importance of analyzing the available milk supply; consequently we undertook the task at the South Carolina Food Research Laboratory, in collaboration with Dr. McClendon of the University of Minnesota. When the results are considered the explanation becomes plain.

We are conducting experiments in order to determine whether spinach or lettuce when reduced to a concentrate and added to the milk formula in small quantities will not overcome the iodine, iron and other mineral deficiencies. The analysis of the spinach[20] being used is as follows: iron 543; manganese 140; copper 15; and iodine 840 parts per billion.

The lettuce[21] contains, approximately, iron 4,000 parts per million and iodine 900 parts per billion. Results are so far most gratifying.

Scharrer and Schwaibold[22] attempted to find out the form in which iodine is combined in milk. They separated the curd from the whey in normal goat milk. No iodine, or only traces, were found in the curd. Even when the animal was fed iodides, less than 1 per cent of the iodine of the milk was in the curd. Normal cow's milk, dried and powdered, gave the following:

Fat	4.5	%	of total	iodine
Protein	3.0	"	"	"
Serum (organically combined)	60.5	"	"	"
Serum (inorganic)	4.0	"	"	"

They concluded that only a very small part of the iodine of milk is in the inorganic form and that most of it is combined with the organic substances of the serum.

Where people do not have goiter or other manifestations of iodine deficiency they receive iodine in its organic relation as it exists in milk, vegetables and fish. There are one or more elements in this organic combination that not only determine the rate of assimilation but its availability as well.

DISCUSSION

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ONE of the striking things in medical history is the geographical distribution of goiter. The highest incidence is found in parts of the Alps, Pyrennees, and Himalayas; the Thames valley in England; certain inhabited districts of New Zealand; the region of the Great Lakes, and the northern Pacific Coast.

Chatin, a French chemist, in 1850 introduced the hypothesis that endemic goiter was due to iodine starvation or insufficient iodine in food and water. Some of the preventive measures used today were first mentioned by Chatin and forgotten, namely, potable water known to contain iodine, food grown in goiter-free regions, and iodinized salt.

Marine's observations stimulated further interest in the theory of iodine starvation. Curiously, his reasonings were initiated when the use of iodine in water prevented thyroid enlargement in trout in hatcheries. Later Marine began his classical study with the children of Akron, O., and goiter surveys and chemical analyses of soils and water began in earnest. Apparently, wherever iodine content of water is less than 23 parts per billion goiter is common. Likewise, food grown in the so-called goitrous region may be low in iodine content.

McClendon states that oats grown in Minnesota contain 10 mg. of iodine per metric ton while near Wiscasset, Me., the content is 175 mg. This same author has recently published an exhaustive survey of the soils of South Carolina and, unfortunately, compared the results with those of California, to the detriment and chagrin of the latter.

Usually, the green vegetables, milk and fruits grown in goitrous regions are richest in iodine. There is little in wheat, and therefore flour, for it is mostly in the bran.

According to McClendon, the normal thyroid gland contains about 40 mg. of iodine. In experimental diets, the intake and outgo being carefully determined, it would require 40 years to accumulate 40 mg. Rochester, N. Y., adds iodine to its water supply, using about 1/10 lb. of sodium iodide per million gallons of water.

Historically, it is of interest to record data as to the Goiter Springs or Krapbrunner in Europe. These springs became quite celebrated because of the hope that the waters would produce goiter in those drinking it and debar the recruit from miltary service. The water was enormously filthy from the bacteriological standpoint.

One of the extraordinary facts of recent medicine and surgery is that goiter may be a factor in the occurrence of malignancy or cancer. For instance, in the Berne, Switzerland, area, an endemic center of goiter, the occurrence of malignant growths is about 1 to 100, while in the United States it is 1 to 1,000.

The clinical use of so-called glandular extracts in the treatment of cancer is based on the theory that one of the causes of cancer may be some unwholesome biological condition of the internal glands, particularly the thyroid and the suprarenal. There is no doubt that heredity plays its part in goiter as in cancer. Familial tendency to goiter has even occurred for three generations, and members of goitrous families have developed the disease or tendency while living in different regions. Shivess mentions the fact that there must be some reason why a goitrous mother will have goitrous children, particularly girls. King's opinion is that the simple adenomatous goiter is congenital and is subsequently stimulated by iodine deficiency, pregnancies, and mental and physical stresses. Exophthalmic goiter, however, depends on mental or emotional disturbances, trauma and shock. Finally, the colloidal goiter is due to iodine deficiency.

Jordi's feeding experiments on tadpoles in the laboratories of the Hooper Foundation of the University of California, using normal and abnormal thyroid, showed remarkable variations in growth, particularly with the normal. With this the animals showed marked decrease in size when compared to the usual controls. With abnormal thyroid, there occurred *specialized* effects on growth, indicating that dysfunction is by no means a minor clinical matter.

Whatever the cause or effect, the general public should note primarily the factor of iodine deficiency in food and water. General dosage of the people with iodized salt, chocolate iodine, or iodine in water supply should only be done under careful supervision of qualified physicians. Even then the question of goiter prevention in

the mass may be fraught with danger, and caution is urged accordingly. Moreover, it must not be overlooked that iodine in soil may or may not be in a soluble form and in different amounts in different types of soils. It appears that organic iodine in soil is a prerequisite for iodine containing vegetables. In addition, the significance of iodine in underground water supplies may overshadow the contents of surface soils. Likewise, appreciable quantities of iodine in food are not lost in cooking in the pot or processing in the can.

Apparently, as soon as the store of iodine in the thyroid gland falls below 0.1 per cent, the gland begins to enlarge. Finally, iodine can be safely given to those between the ages of 10 and 20 years living in goiter areas, but under medical supervision. Usually, small doses of iodine several times a year will guard against injury by the iodine.

Laboratory and Clinical Resources in Physical Examinations

THE appearance of articles in medical publications arguing the respective merits of clinical and laboratory methods is evidence that the medical profession has not fully comprehended the possibilities of preventive medicine. The complete physical examination of the apparently well does not necessarily require the use of all the laboratory aids at the disposal of the medical profession. At the same time, failure on the part of the examining physician to avail himself of the benefits of laboratory studies that he thinks unnecessary may result in a mistaken diagnosis. The patient who seeks a physician because of a discomfort that to his mind has not reached the dignity of an illness is entitled to receive the benefit of all the aids that clinical and physical laboratories have to offer. The question of cost should not enter into the calculation. If the patient is unable to pay, his recourse is the charitable institution. If the patient is able to pay, he should certainly not be denied the service.

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Today physicians in increasing numbers realize that laboratory findings stimulate alertness of observation as well as compel more painstaking physical examinations. They are learning that when laboratory and clinical findings conflict, further clinical study of the patient will often explain the seeming discrepancy. Many things accepted as facts are based on wrong conclusions of preceding observers. Only careful and recorded studies of the apparently well and slightly ill will disclose such errors.—Keating, Emmet, M.D., In at the Death, *A. M. A. Bull.*, Nov., 1930.

Local Public Health Work in Mexico*

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IN Mexico, the Constitution makes the Federal Department of Health the supreme authority in matters of hygiene, and the *Sanitary Code* is the basis for federal action. The present program to help the cities toward the organization of their municipal hygiene is fostered and directed by the Federal Department of Health, with the coöperation of the most progressive and advanced states. The fundamental requirement for the formation and establishment of local sanitary institutions is the effective and substantial economical support of the local authorities. The existing health units carry on, thanks to a strong and generous federal support, which we hope will gradually give way to due appropriations from the local budgets.

When a state and a municipality, as happens in Veracruz, are ready to coöperate financially and administratively, the Federal Health Department is willing to give support, favoring and directing the establishment of permanent sanitary centers, which become a part of the community, doing a continuous beneficial hygienic work which can be seen and appreciated by the people.

While some states have boards of health with modern programs of preventive medicine and hygiene, others have no organization which could be rightly so considered, from the public health standpoint. As you are well aware, it has been difficult in all countries to awaken the municipalities and local authorities to their responsibilities in providing administrative and financial facilities for public health work. We read that to start the work in most counties of the United States it has been necessary to insure the coöperation of the U. S. Public Health Service and the International Health Board with the local authorities, which finally has resulted in the existing county health work with technical direction and economical coöperation on the basis of $1 from the federal government, $3 from the state government, and $4 or more per capita from the municipality.

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* Read at a Post-Convention meeting of the American Public Health Association in Mexico City (following the Fifty-ninth Annual Meeting in Fort Worth, Tex.), November 3, 1930.

A greater development of health units will come in Mexico when a legal provision is established to enable the Federal and State Health Departments to offer to those communities which will accept their responsibilities, effective technical advice along with proportional financial coöperation.

Coöperative health work began in the United States in 1920, and promptly spread all over the world, giving a new hope and a new element of victory to the hygienists of the world. In Mexico it was initiated in 1925, the first Mexican sanitary unit having been established in Minatitlan and Puerto Mexico in 1928, followed by one in Veracruz, May 17, 1929; one each in Tuxtepec, Oaxaca, and in Tierra Blanca, Veracruz, in 1930, forming the nucleus of city and rural modern coöperative health work.

The progress has not been so slow if we consider the difficulties of creating at the same time—parallel to the coöperative health organizations—a public spirit, comprehensive enough to ask for the services of sanitary organizations of an apparently complicated type. Here again the experiences of the United States and Mexico are similar, that is:

> In the administration of public health the states are sovereign units, and the experiences gained in one state cannot be put to use in a less progressive state except by the process of demonstration, education and slow growth.

In our Republic, the type of rural communities where the public health activities are most needed is almost uniform in one respect—the lands of the municipality lie around a center where all the houses are grouped to form the village or town proper. We do not commonly see, as in the United States, the farm owners, their families and workers living on their respective lands, but rather in the villages or what we call "pueblos." The agriculturists start their daily work by a trip from the town to the surrounding fields, returning at sunset to the village where they live.

These towns all have market-places for exchange of daily commodities, using common water sources, either a river, various wells, or a spring. When the people move to sell their crops and products from one town to another, they all go on the same day and almost at the same time. This rural situation gives to the epidemics certain aspects, which good observers have followed on the map—as well as on the calendar. Dr. Pardo writing about a typhus epidemic, in 1915, in the City of Oaxaca and the neighboring towns, speaks about the spread of the disease from place to place following the market day in each: Thursday for Ejutla, Friday for Ocotlan, Saturday for Oaxaca, Sunday

for Tlacolula—the movements of the people in the Valley of Oaxaca, and the spread of the disease coinciding with their commercial relations.

The contaminated water of a source which is generally used for most of the people is equally dangerous for all inhabitants; instead of dealing with family typhoid the case is one of village typhoid. Our greatest general public health problem is the lack of adequate provision of pure water and its complement for the sanitation, sewage disposal. The heavy expense involved retards the solution. We do not ignore the facts and are anxious to correct them, but our limitations are those of any reconstruction period, overcrowded with many pressing problems. Among them are extension of popular education, good road communications, and modern disease prevention to reduce our high morbidity and mortality rates. It is not difficult to understand the amount of energy, the intensity of effort, and the greatness of the ideal which we need to carry us through a task of centuries in a score of years.

PUBLIC HEALTH IN VERACRUZ

As previously stated, the first coöperative sanitary unit was established in April, 1928, to work jointly in the municipalities of Minatitlan and Puerto Mexico. It has, as all the others have, the coöperation of the Federal Department of Health, the State Direction of Health, the two municipalities, and the International Health Board of the Rockefeller Foundation. This unit gives its services to a total population of 25,000 people and has the following fundamental principles:

1. The basis of all procedures is public health education.
2. All the sanitary personnel are chosen for their experience, training and standing.
3. All employees are full-time, devoting their energies to this one work. This applies to the Director, who is a full-time Health Officer.
4. The organization is permanent in the place where it is established.
5. The work is done with the strictest economy of expenditures.
6. Technical and financial support must be given in full coöperation by the civilian and sanitary authorities.

With this general basis, on May 16, 1929, the City of Veracruz witnessed the inauguration of a coöperative sanitary unit to serve a population of 70,000 people. The establishment of this unit constitutes a progressive step in the sanitary services of that city, because of its importance as Mexico's principal port, and because of the special services which the Federal Department of Health has maintained in Veracruz since 1920, with the object of preventing the return of yellow fever and bubonic plague to the country. The yellow fever campaign

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was extended some years ago to anti-larval work for malaria eradication, and its total accomplishments are a natural link and support to the new institution.

It was justifiable to pass from the campaigns against yellow fever, malaria, and bubonic plague, to a most comprehensive and extensive health program, with the desire to complete the hygienic work, using the results obtained by the expenditures of the preceding years to promote the control of other communicable diseases and to establish prenatal and postnatal clinics, to start school hygiene work, to provide laboratory facilities for diagnosis and prevention, adding sanitary engineering and inspection for the supervision and control of foods, particularly milk and water.

We must say here a few words about some high spots in the history of the sanitary work in Veracruz, and pay a tribute of admiration to the public health workers the effect of whose labor appears clearly in the mortality statistics of the past 40 years. Veracruz was a victim of yellow fever, malaria, tuberculosis, and gastrointestinal diseases up to 1903, when the first public health activities of significance were directed by the glorious Dr. Liceaga, then President of the Superior Board of Health.* His intelligence and influence had obtained, when the artificial construction of the port was about finished, the introduc-

* President of the A. P. H. A. in 1896.

tion of the water supply and the installation of the sewage disposal system, which were concluded in 1904.

With the sanitation, Liceaga started the modification of Veracruz, and September 1, 1903, began his famous campaign against yellow fever. His coworkers were Drs. del Río, Macías, García Iturralde and Manuel S. Iglesias, the latter three times vice-president of the American Public Health Association. He lives now in Veracruz and relates in very interesting articles how yellow fever was eradicated for the first time from that city in 1910. After bringing in the water supply, introducing the sewerage system and destroying the breeding places of the *Aëdes Aegypti,* the health of Veracruz was marvelously improved. The crude annual death rate per 1,000 went down from 63.88, average for the 10 years preceding Liceaga's work, to 44.58 for the decade following. The rates for the principal causes of death changed as follows: gastrointestinal diseases, from 126.57 in 1898 to 46.20 in 1909; malaria, from 109.53 in 1903 to 38.96 in 1910; tuberculosis, from 124.86 in 1898 to 50.91 in 1911; and yellow fever from 191.61 in 1899 to disappearance in 1910.

Ten years later, 1920, Veracruz suffered the return of yellow fever which was extinguished in 1921 by the combined efforts of Drs. Malda, Lyster and Brioso Vasconcelos, Caldwell, Graham Casasús, Macías, Loyo and Ojeda Falcon. The same year brought a new scourge, bubonic plague, which however was quickly extinguished by the adoption of deratization measures. The statistics show a sad elevation to very high mortality rates from 1915 to 1920, and the return of the above mentioned epidemics imposed the necessity of renewed activity to solve the public health problems of Veracruz.

For years, attention was given only to the anti-larval and anti-plague services, from the results of which came the desire to reduce still more the too high morbidity and mortality rates. To do so, it was necessary to secure the coöperation of the federal, state, local, and International Health Boards, and in 1929, the coöperative Sanitary Unit of Veracruz was established.

The Sanitary Unit of Veracruz follows in a general way the principles and programs which the experienced public health workers, particularly those of the American Public Health Association, teach in the *Journal* and other publications, and also the advice given by European hygienists in the League of Nations papers relating to hygiene. Particular recognition is due also to the professors of the School of Hygiene and Public Health of the Johns Hopkins University and the International Health Board for their teachings.

The technical advisers of the Unit are: the Chief of the Federal

Health Department, the Director of the State Board of Health, the Sub-director of the Hookworm Campaign, representing the International Health Board, and the City Councilor of Sanitation, nominated by the City Government. This body of advisers constitutes the Superior Board of Technical Directors.

The institution is adapted to the particular conditions due to educational, psychological and economic factors prevailing in Veracruz. The organization has the following sections or bureaus:

SANITARY UNIT OF VERACRUZ

Direction with:
- Education and training of personnel
- Public health education:
  - Posters
  - Circulars
  - Lectures
  - Motion pictures
- Vital statistics:
  - Collection from the Civil Register
  - Classification
  - Interpretation
- Organization and administration

Communicable disease control:
- Diagnosis, immunization, hospitalization:
  - Reporting
  - Maps and cards
  - Control practices
- Antilarval service for:
  - Yellow fever prevention
  - Malaria control
- Antirabic treatments:
  - Animal vaccination against rabies
- Bubonic plague prevention
- Smallpox vaccination
- Typhoid and paratyphoid fever control
- Tuberculosis control
- Venereal disease control
- General communicable disease control
- Hookworm diagnosis, treatment and prophylaxis

A. Child Hygiene:
- Prenatal service
- Infant hygiene service
- Visiting nurses and propaganda

B. School Hygiene:
- Physical examinations
- Dental hygiene
- Visiting nurses

Laboratory:
- Diagnosis and bacteriological examinations
- Conservation and distribution of vaccines, serums, antitoxins, and chemical products used against malaria, syphilis, and dysentery
- Preparation and distribution of material for collection of samples

Inspection of Foods and Beverages:

A. Veterinary Inspection:
- Sanitary control of milk
- Meat inspection and markets
- Fish and shellfish sanitation

B. Sanitary inspection of foodstuffs, refreshments, soft drinks, and food handlers

Sanitary Engineering:
- Street cleaning service
- Inspection of sanitation in hotels, boarding houses, etc.
- Technical advice in relation to the water supply, control of chlorination
- Technical advice in relation to sewage disposal
- Surface drainage, filling and ditch conservation for the antimalarial work
- General problems of sanitary engineering
- Building inspection

The program of work has been carried on since May 16, 1929. To begin with, there were taken on the then existing Federal Health Services, namely, the anti-larval, the anti-plague and the anti-rabic. The street cleaning which was previously done by the municipality was reorganized; all usable equipment repaired, and new and modern trucks were purchased to insure an efficient service. Immediately the Hookworm Clinic was initiated with treatments and lectures, the laboratory opened, and meat inspection established. In addition, reporting of communicable diseases, home visiting, and measures of control began to be taken. By the middle of August, 1929, the Venereal Disease Clinic was ready, and by the end of the same month the prenatal and postnatal centers were opened. In November, the work of school hygiene was initiated, and finally on January 26, 1930, we had the satisfaction of completing the organization of a Maternity Home and

HOOKWORM CLINIC, VERACRUZ

Nursery School under the administration of the Veracruz Sub-committee of the National Association for Infant Protection, which though separated from the Health Unit, economically and administratively, depends upon the medical services and advice of the director and technical personnel of the Sanitary Unit.

The kindness of the women in charge gives to us the full coöperation of their association, and with their help, our program for child hygiene goes as follows:

Prenatal care—Given in the clinic of the Sanitary Unit. Examination, instruction and care of pregnant women.

Natal care—In the Maternity Home of the local Committee for Infant Protection.

Postnatal care—From birth to 2 years of age, in the clinic of the Sanitary Unit.

Preschool hygiene—From 2 years to school age in the nursery school of the Committee for Infant Protection.

Hygiene of the School Child—Physical examinations by the Child Hygiene Section of the Sanitary Unit.

In Veracruz the principal obstacle is the lack of public health education. Although the people are ready to accept clear explanations, the general bystander thinks that the principal occupation of the department should be the correction of nuisances, particularly if they produce offensive odors. The Health Officer is very often transformed into a judge of complaints which belong to the police or are matters of the city ordinances and not of the sanitary laws.

At present our outstanding problems are the reduction of morbidity and mortality for gastrointestinal diseases, tuberculosis, and typhoid fever. To compare the changes in the numbers of deaths and death rates of the mentioned diseases Table I is presented. Yellow fever, bubonic plague, and smallpox have been eradicated. Tuberculosis, which had the rate of 1,250.5 per 100,000 in 1892, still had the high rate of 423.8 in 1928; however, the lowest in 39 years.

There is at present a general decline. Deaths from gastrointestinal diseases were at the lowest rates known in Veracruz from 1907 to 1911. They went up in 1915, and these diseases remain now the principal causes of death.

Malaria was so high early in the century that it occupied the first place among the causes of mortality in 1903, but the work against yellow fever and general sanitation brought the rates down, only to rise again in 1915, going above tuberculosis in 1918 and 1919, and from then on the fall has been constant, due to the anti-larval work, with the result that last year malaria ranked 8th as a cause of death. Oiling, stocking with minnows, drainage, filling of swamps and Paris

OLD TYPE OF MILK MEN SELLING MILK FROM HOUSE TO HOUSE

green are used against malaria. House-to-house inspections and destruction of breeding places are a daily feature of the anti-mosquito work.

In 1929, the crude death rate of 27.55 per 1,000 was the lowest in the 40 years of our statistics. For the 9 months of 1930 the rates are: birth rate, 44.39 per 1,000; crude death rate, 26.14 per 1,000; infant mortality, 100.15 per 1,000 living births. To be sure, we are not satisfied, but merely encouraged by present conditions. However, our desire and effort is to reduce further the rates to approximate those of the leading countries in public health work, particularly the United States, where our knowledge of sanitary science has its source.

Following the example of other cities in the reduction of disease we began to attack the water-borne diseases, among other measures petitioning the Committee on Material Improvements and the municipality to chlorinate the water supply, for which they installed a chlorinator February 22, 1930. Unfortunately the water supply and sewerage systems, adequate in 1903, are entirely insufficient and in bad condition for 1930, due to the increase in population, extension of the city's boundaries, and lack of thorough repairs.

A milk ordinance for the State of Veracruz issued to take effect February 17, 1930, has been applied gradually in the City of Veracruz and the following changes have taken place in one year. In May, 1929, all milk was sold from house to house by men on mules or horses.

TABLE I

CRUDE DEATH RATES, CITY OF VERACRUZ, MEXICO—1891-1929

ALL CAUSES AND PRINCIPAL CAUSES OF DEATH

Years	Population	Number of deaths excl. of still-births	Death rate per 1,000	Deaths due to gastro-intestinal diseases	Death rate per 10,000	Deaths due to tuberculosis	Death rate per 10,000	Deaths due to yellow fever	Death rate per 10,000	Deaths due to malaria	Death rate per 10,000	Deaths due to typhoid fever	Death rate per 10,000	Deaths due to small-pox	Death rate per 10,000	Deaths due to bubonic plague	Death rate per 10,000
1891	19,377	1,311	67.65	112	57.80	241	124.37	178	91.86	113	58.31	1	0.51	0	0	0	0
1892	20,554	1,433	69.71	172	83.68	257	125.03	259	126.00	147	71.51	2	0.97	6	2.91	0	0
1893	21,731	1,350	62.12	169	77.76	260	119.64	130	59.82	66	30.37	0	0.00	7	3.22	0	0
1894	22,908	1,557	67.96	215	93.85	237	103.45	207	90.36	59	25.75	1	0.43	34	14.84	0	0
1895	24,085	1,348	55.96	167	69.33	238	98.81	140	58.12	54	22.42	1	0.41	0	0.00	0	0
1896	25,800	1,367	52.98	199	77.13	267	103.48	0	0.00	122	47.28	7	2.71	10	3.87	0	0
1897	27,516	1,556	56.54	281	102.12	314	114.11	4	0.14	184	66.87	4	1.45	1	2.54	0	0
1898	29,231	1,995	68.24	370	126.57	365	124.86	128	43.78	246	84.15	1	0.34	0	0.00	0	0
1899	30,947	2,423	78.29	362	116.97	346	111.80	595	191.61	286	92.41	1	0.32	19	6.13	0	0
1900	32,663	1,940	59.39	303	92.76	322	98.58	262	80.21	220	67.35	1	0.30	177	54.18	0	0
1901	34,708	1,839	52.98	327	94.21	334	96.23	102	29.38	226	65.11	0	0.00	4	1.15	0	0
1902	36,754	2,339	63.63	361	98.23	368	100.12	285	77.54	371	100.94	1	0.27	21	5.71	0	0
1903	38,800	2,479	63.89	379	97.69	393	101.29	375	96.65	425	109.53	2	0.51	1	0.25	0	0
1904	40,845	1,744	42.69	312	76.38	368	90.09	12	2.93	236	57.77	0	0.00	2	0.48	0	0
1905	42,891	2,040	47.10	340	79.27	408	95.12	23	5.36	359	83.70	1	0.23	0	0.00	0	0
1906	44,937	1,816	40.41	302	67.21	461	102.58	12	2.67	251	55.85	1	0.22	3	0.66	0	0
1907	46,982	1,776	35.65	225	47.89	414	88.11	1	0.21	239	50.87	2	0.42	4	0.85	0	0
1908	49,028	1,980	38.76	246	50.17	419	85.02	20	3.87	248	50.58	1	0.20	3	0.61	0	0
1909	51,074	1,622	30.53	236	46.20	347	67.94	3	0.78	207	40.52	5	0.97	15	2.93	0	0
1910	53,120	1,620	30.20	262	49.32	311	58.54	1	0.18	207	38.96	12	2.26	0	0.00	0	0
1911	53,630	1,918	35.44	272	50.71	273	50.91	0	0.00	237	44.19	4	0.74	1	0.18	0	0
1912	54,141	1,821	33.22	407	75.17	308	56.88	0	0.00	181	33.43	6	1.10	0	0.00	0	0
1913	54,651	1,709	31.27	268	49.04	328	60.02	0	0.00	157	28.73	4	0.73	19	3.47	0	0
1914	55,162	1,857	33.66	435	79.38	277	50.21	0	0.00	70	12.68	2	0.36	53	9.60	0	0
1915	55,672	3,807	68.38	1,437	258.11	474	85.14	0	0.00	104	18.68	57	10.23	316	56.76	0	0
1916	56,183	3,495	62.20	1,218	216.79	449	79.91	0	0.00	288	51.26	110	19.57	109	19.40	0	0
1917	56,693	2,310	40.74	842	148.51	342	60.32	0	0.00	175	30.86	4	0.07	29	5.11	0	0
1918	57,204	2,703	48.11	607	106.11	394	68.87	0	0.00	395	69.05	45	7.86	2	0.34	0	0
1919	57,714	2,674	47.16	577	99.97	386	66.88	0	0.00	396	68.61	33	5.71	1	0.17	0	0
1920	58,225	2,974	51.98	582	99.95	395	67.84	154	26.44	326	55.98	23	3.95	6	1.03	37	63.54
1921	59,463	2,343	40.59	521	87.61	340	57.17	8	1.34	235	39.52	26	4.37	6	1.71	0	0
1922	60,701	2,251	38.66	502	82.70	343	56.50	0	0.00	192	31.63	42	6.91	6	0.98	0	0
1923	61,939	2,208	37.13	485	78.30	348	56.18	0	0.00	158	25.50	21	3.39	19	3.06	0	0
1924	63,177	2,574	42.40	736	116.40	418	66.16	0	0.00	158	25.00	31	4.90	31	4.90	0	0
1925	64,415	2,638	40.95	844	131.02	402	62.40	0	0.00	159	24.60	35	5.43	43	6.67	0	0
1926	65,653	2,439	37.14	596	90.78	314	47.82	0	0.00	138	21.01	48	7.31	0	0.00	0	0
1927	66,891	2,290	34.23	495	74.00	324	48.43	0	0.00	133	19.88	64	9.56	0	0.00	0	0
1928	68,129	1,970	28.91	505	74.12	290	42.38	0	0.00	98	14.12	50	7.33	0	0.00	0	0
1929	69,367	1,938	27.93	485	69.91	307	44.25	0	0.00	44	6.34	38	5.49	0	0.00	0	0

Less than 1 per cent of the supply was bottled, none was refrigerated, and there was widespread adulteration and use of chemical preservatives. By February, 1930, all milk was bottled, handled in especially equipped distributing centers, called "Lecherías," which are required to be painted white and screened, and distribution is done by means of trucks or milk wagons. By August, 1930, more than 75 per cent of the supply was refrigerated at 10° C., and we expect shortly to have 100 per cent milk refrigeration. The daily inspection and laboratory examinations show that adulteration and use of chemical preservatives have been reduced to 0.11 per cent.

The general public is open minded and receives willingly the new services when they show their advantages. Mothers visit freely the prenatal and postnatal clinics, and the attendance of pregnant women has increased steadily from August, 1929, to August, 1930. The monthly average of new examinations is 52, with 237 reëxaminations and 17 deliveries of mothers visiting regularly at the clinic. The examination of infants brought for advice has increased from 142 per month for 1929, to 282 per month for 1930, an increase of almost 50 per cent. The follow-up work done by the visiting nurses gives good contact with the people, and generally they are well received by the mothers and families.

The hookworm clinic shows proudly 17,798 treatments in 17 months, an average of 1,450 per month, without any serious accidents. Two hundred and sixty-four lectures have been given and practical demonstrations of hookworm eggs and larvae are used as educational methods.

For 16 months not a single case of smallpox has been recorded in the city. The venereal disease clinic, the first to be established for public health work in Veracruz, has had a monthly attendance of 150 patients. Moving picture propaganda has been shown at clubs, unions and lodges.

The laboratory service makes constant analyses of water, milk and other foodstuffs; examinations are made for diagnosis of malaria, typhoid fever, syphilis, tuberculosis and other diseases. The fecal examinations for intestinal parasites have shown 7,074 positive specimens for hookworm eggs; 5,929 for ascaris; 12,566 for trichocephalus.

The Sanitary Engineering Bureau has controlled the chlorination of water and ice, the drainage and filling of swamps for anti-malarial work, street cleaning service, and building and housing inspections. Among the principal works accomplished are the construction of the Avenida Cuauhtemoc ditch, and the straightening of the Avenida Revillagigedo channel, which have saved the city from the inundation of the sand dunes' water shed.

The personnel is 100 per cent full time, honest and enthusiastic, and it is due to their earnest work that something has been accomplished. The Federal Health Department has given full support without any restrictions, and their generous attitude is particularly responsible for the existence of the Unit. Their part of the budget is 84.24 per cent. The State Direction of Health has given aid to the budget of 1.71 per cent, and has published different ordinances. The city, due to financial conditions, has not been able to increase its share, 12.33 per cent, but has accepted suggestions from the Unit for water purification. There is a strong general and popular desire to obtain for the city a good water supply and sewage disposal, which will prove an immense good when completed, with the support of the Board on Material Improvements. The Rockefeller Foundation contributes 1.71 per cent of the budget, and has an adviser on the Board of Directors.

Besides the already existing Units in Veracruz, Minatitlan, Puerto México, Tuxtepec and Tierra Blanca, other cities are organizing local health services. All states have delegations from the Federal Department of Health, and many of them local councils of hygiene. In different towns we notice a growing interest in the organization and development of the Units, and because of the ever progressive and modern ideas of the authorities of the Federal Department of Health we are sure that the municipalities with enough civic spirit and desire to pay for their own health will make a good investment, with a proportional support from the Federal Government.

Then with all the nation working for its health, united in a good program of disease prevention and health promotion, the present generation will see passing forever from our statistics thousands of preventable deaths, the coming of healthier citizens, and medical science not only the consolation of the sufferer and cure of the sick, but the teacher and provider of a healthier and happier life.

Pasteur, Koch, Ross, Gorgas, Finlay, Liceaga, Ferrán, Cruz, Carrión, heroes of humanity, have passed from hand to hand the torch of light for us to follow.

The Public Health Nurse in a Rural Health Department

An Introductory Report on the Study in Progress in Cattaraugus County*

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THE generalized public health nurse is recognized as so important an agent of the present and future health department that the development of her activities requires careful consideration and appraisal by those who are interested in the trend of public health administration and in the evaluation of its results. In those localities where a generalized nursing system has been put into operation, more and more manifold duties are being assigned to the nurse; greater responsibilities are being placed upon her shoulders; and a keener initiative is being demanded of her. In fact, her very designation as "nurse" is becoming a misnomer, for she is expected to be also the teacher and sanitarian who is required to carry into the home, school, clinic, and welfare station, the interpretation and explanation of modern hygiene, and put into effect the approved and newer measures for prevention of disease and promotion of health.

These newer functions are well illustrated in the experience of the Rutherford County Child Health Demonstration which was that the generalized nurses "proceeded to occupy—as completely as they could in view of the scattered rural population—all the accepted fields of public health nursing service," and "the shuttle services between the health department, the private practitioners, and the individual, tended to unify and simplify, in the popular mind, the meaning of the whole enterprise."[1] Or again, in reviewing the experience of the general health demonstration in Cattaraugus County, it was stated:

> The public health administrator realizes that scarcely a wheel can turn in his health machinery without the nurse. To say that she is indispensable to the program does not cover the fact. To a great extent, her work *is* the program. It is one thing to have a certain number of nurses. It is quite another to have the work

* This is the first of a series of papers presenting the results of studies of public health nursing in different types of official health administrations.

of these nurses thoroughly interrelated with an active clinic service, with systematic communicable disease control, with comprehensive local laboratory work, all properly set in a routine that binds the whole into one fabric.[2]

It is inevitable that, in the process of this development, some confusion exists as to what the proper functions of the official public health nurse are and as to what directions they should take. This is evident in the current discussions of the precise rôle the generalized nurse should play in the many activities in which she already is engaged; of the amount of time that she should give to school hygiene, or to infant welfare, or to tuberculosis or other public health activities in order to bring about what we like to call a "well balanced program"; of whether or not less professional training as a nurse and a greater emphasis on public health training would fit her better for the job which she has to do; and of the persistent question of generalized versus specialized public health nursing. It would seem that the time has come, at this stage of the development of the official public health nurse, for more or less detached studies of the actual work performed by her in different types of rural and urban health administrations.

These studies should help in answering questions as:

To what extent does the public health nurse serve the entire population of different types of communities and in different types and kinds of health administrations?

Using records of births, school defects, illness among school children and in the general population, the findings of examinations and inspections of preschool children, communicable disease reports, clinic records of tuberculosis, venereal disease and the like, as indications of the demand or the needs for nursing services—to what extent does the official public health nurse supply this demand or meet these needs under varying conditions?

How effective is the work of the public health nurse in accomplishing its objectives in each specific activity in which she engages?

To what extent does she come into contact with conditions not reached through channels already provided by the official and voluntary agencies?

What duties now performed by the public health nurse could be performed by some other type or types of workers without, perhaps, her professional training, but with more specialized training in certain directions?

What is the "case load" of a public health nurse working in an official health administration?

What basic considerations should be taken into account in formulating the nurse's program of work if an analysis of her job is made from the point of view of the administration as a whole?

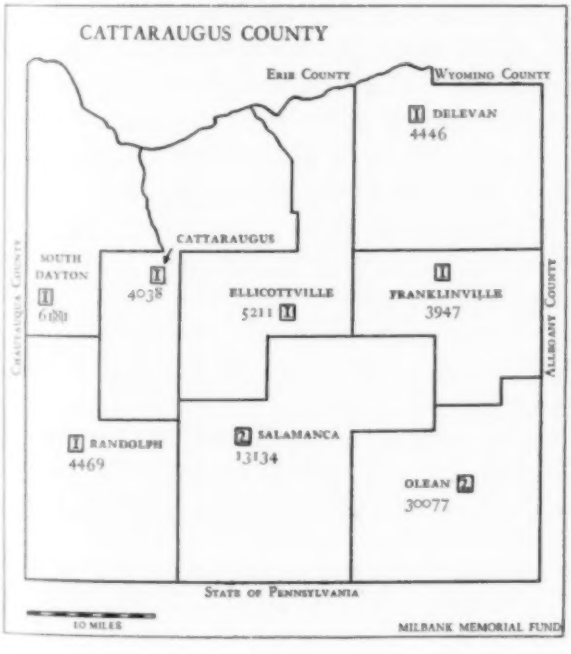
To what extent do physical factors interfere with the performance of her duties, such as distance, the weather, and the condition of roads?

It is easy to theorize in attempting to answer such questions as these and to set up programs of work and schedules of activities that

look well on paper, and even to formulate standards, such as those tentatively set forth in our "appraisal" forms. Obviously, the more factual data available, the more accurate will be our analyses, and the more sound our conclusions and our standards. By factual data is meant not merely the statistical record of the volume of work of the nurse, but the more intimate picture of conditions under which she "carries on"; the problems which she encounters; the services she actually renders; and the things she is able to accomplish.

As a beginning in a series of studies of the work of the official public health nurse, the Research Division of the Milbank Memorial Fund naturally turned to the experience of Cattaraugus County, where the Fund has been assisting in the establishment of a well rounded county health department. This paper is an introduction to the more complete reports in preparation, and deals specifically with the *home visits* of public health nurses. The experience of the nurses in all phases of the work for a year will form the basis for the more complete reports. The following discussion utilizes a sample of the records that represents the actual experience in home visiting of approximately the equivalent of 3 nurses for 6 months. It is offered as a progress report on an experiment in the collection and use of data for the purpose of throwing further light upon factors requiring administrative consideration.

The Cattaraugus County Health Department, serving a primarily



Map showing the division of the county according to nursing districts, with the population of each, exclusive of Indians. The squares indicate the location of the district health stations, and the numeral within the square, the number of county staff nurses working in that district.

The central administration office is in the Olean district. The city of Olean, with a population of 21,350, employs school and city nurses. There is also in this district a community nurse supported by the residents of Portville to serve its population of 1,435.

One of the county nurses in the Salamanca district serves a population of 9,900 in a concentrated urban area. The city of Salamanca employs a school nurse.

rural area of 1,343 square miles, has sponsored a generalized nursing service for several years. The number of staff nurses has varied from 14 to 10, the present personnel consisting of a director of the Bureau of Nursing, 2 supervisors, and 10 staff nurses. The population of the section allotted to each nurse has varied from approximately 3,500 to 4,500, the latter figure representing the present average potential group for which a nurse carries on all the public health nursing activities of the health department.

NATURE OF RECORDS USED

In order to obtain the desired information it was found necessary to supplement the records already in use. From the existing system of nursing records, it was not possible to obtain comparable data for all home visits.* For example, single communicable disease visits were not recorded on any record form giving information relative to the individual visited. Again, it was not possible to relate the nurses' home visits made in the interest of getting school children's defects corrected to the number of children visited, because a definite record of visits was not kept on every individual school child's record card. For purposes of complete analysis of the nursing activities this information is just as important as that on the record of the individuals visited in the interest of tuberculosis control.

Accordingly, and with the assistance of the Milbank Fund's staff, a new and simplified record system was instituted by the health department in February, 1930, which made provision for recording comparable data for every home visit. These data include information regarding the source of first information about the case, the nature of the problem, date of visit, services rendered at the time of each visit, results, and the reason for termination of the case. In other words, they were intended to record answers to these questions: "Why did the nurse visit? What did she do, and what happened?" As a further aid to making data comparable, emphasis was given to the importance of uniformity in recording the content of the nurses' visits.

A family folder was already in use which contained nurses' records for all members of the family, but with the new record system all information concerning the family is filed in this folder, namely, social history, clinic records, nurses' records, and special reports. These are filed in the 8 district health stations where the clinics are held and the

* Two reasons for this were (1) a certain lack of uniformity in recording the content of the nurses' visits, and (2) the prevailing practice of the nurse not keeping a record of the single health education visit made as a health department representative other than including it in her daily summary report of the total number of visits made.

nurse has her office. With the exception of a family index card, no records are kept in the central office, the distances making decentralization of records far more satisfactory.† When a family folder is not "started," the comparable data regarding the single health education visits are recorded on call slips. The complete information from these call slips makes available certain data heretofore incomplete.

A comparison of the number of visits represented in the sample of records used for this report with the reports of the total visits made by all the nurses on the staff in the same 6 months is shown in Table I. Since the percentages of visits made to individuals in each age group are so similar, it seems reasonable to conclude that the sample adequately represents the distribution of visits according to problems and age groups.

TABLE I

COMPARISON OF SAMPLE OF RECORDS WITH REPORTS OF TOTAL VISITING BY ALL THE COUNTY HEALTH DEPARTMENT NURSES, ACCORDING TO NUMBER AND PER CENT OF VISITS TO CASES IN EACH AGE GROUP

(February 1 to August 1, 1930)

Age Group	Number of Visits		Per Cent of Visits	
	Sample of Records	Reports of Total Visiting	Sample of Records	Reports of Total Visiting
Infant	240	1,422	16.4	15.4
Preschool	327	2,425	22.4	26.3
School	571	3,033	39.1	32.8
Adults	232	1,655	15.9	17.9
Maternity	89	702	6.1	7.6
TOTAL	1,459	9,237	99.9	100.0

THE EXTENT AND NATURE OF HOME VISITING

The indication afforded by our sample as to the extent of certain phases of the work done by generalized public health nurses in home visits in a rural area is summarized in the following tables and comments.

Assuming that the sample of data showing 1,459 visits to 733 individuals represents the ratio of individuals visited to visits made, it is estimated that 1 individual is visited for every 2 visits. Applying this ratio to the 9,237 visits recorded in the reports of the total work, it is estimated that 4,618 individuals or approximately 9 per cent of the

† A family folder index card containing a minimum amount of information is filed in the central office. This is sufficent to permit clearance of cases with the social Confidential Exchange and facilitate transfer of a record if a family moves from one district to another in the county.

TABLE II

DISTRIBUTION OF FAMILIES ACCORDING TO STANDARD OF LIVING

Standard of Living	Number	Per Cent
Well-to-do	8	2
Comfortable	50	12
Moderate	199	49
Poor	113	28
Very Poor	35	9
TOTAL *	405	100

* Excluding 21 families for which standard of living was not recorded.

total population * were visited by the county department of health nurses in 6 months. This probably means that the nurses visit about 14 per cent of the population in a year although later studies of the total year's work may modify this figure. This refers to the number of persons who received *any* home visit or visits from the public health nurse, regardless of the problem or several different problems occurring during a given year. The usual reports of official organizations do not give information regarding the per cent of the population receiving public health nursing service.

The economic status of the people visited is indicated approximately in Table II, which presents the nurses' classification of 405 families.

TABLE III

DISTRIBUTION OF 426 FAMILIES ACCORDING TO FREQUENCY OF VISITS BY 3 PUBLIC HEALTH NURSES IN 6 MONTHS

Number of Visits*	Families	
	Number	Per Cent
1	265	62.2
2	61	14.3
3	34	8.0
4	21	4.9
5	16	3.8
6	6	1.4
7	7	1.6
8 or more	16	3.8
TOTAL	426	100.0

* Total of 938 visits to 426 families.

* The preliminary 1930 census figures for Cattaraugus County, exclusive of Olean City, show a population of 51,246.

Table III, a tabulation of the frequency of nurses' visits to 426 families, shows that 62 per cent of the families received only 1 visit. Similar information is given in Table IV, showing the frequency of the visits to the individuals in these families. With the exception of the infant group, 50 per cent and over of all the individuals visited received but 1 visit in 6 months. In both instances, there are included families and individuals for whom service was begun toward the end of the 6 months' period, as well as those who had been receiving nursing visits prior to the stated period. Since the number of visits for a particular problem is not complete, this cannot be thought of as information pertaining to the nursing service as it relates to the particular family or case, but rather as a cross-section of the nursing service given by 3 nurses in a 6 months' period.

How the nurses happen to know about the people to be visited is shown in Table V, which is a tabulation of the source of first information about the cases visited. This information from our sample of records shows that 54 per cent were reports or requests from the official organization. These include reported cases of communicable disease, birth registration slips, and school reports of children with defects needing correction. It is to be expected that a large percentage of such information would come through official channels, but the records serve further to emphasize the selective influence of the organization machinery in determining what work is to be done. The small percentage of the nursing service originally sought or requested by individuals outside of official channels is a point for consideration in for-

TABLE IV

FREQUENCY OF THE HOME VISITS MADE TO INDIVIDUALS IN EACH AGE GROUP, BY 3 PUBLIC HEALTH NURSES IN 6 MONTHS

	No. of Individuals Visited	Total No. of Visits	Frequency of Visits				Per Cent Distribution of Visits				
			1	2–4	5–7	8 or more*	Total	1	2–4	5–7	8 or more
Infants	75	240	29	29	10	7	100.0	38.7	38.7	13.3	9.3
Preschool	168	327	100	60	6	2	100.0	59.5	35.7	3.6	1.2
School	369	571	274	82	12	1	100.1	74.3	22.2	3.3	0.3
Adults	93	232	54	27	6	6	100.0	58.1	29.0	6.5	6.5
Maternity	28	89	14	7	3	4	100.0	50.0	25.0	10.7	14.3
TOTAL	733	1,459	471	205	37	20	99.9	64.2	28.0	5.0	2.7

* Individuals receiving more than 8 visits are distributed as follows: infant, one each 11, 16 and 19 visits; preschool, one 10 visits; school, one 9 visits; adults, one each 9, 10, 11, 16 and 19 visits; maternity, two 9, one each 14 and 17 visits.

mulating the health education program. An important phase of the family health work is indicated by the fact that 24 per cent of the cases visited first became known to the nurses through home visits to some other member of the family.

TABLE V

SOURCE OF PUBLIC HEALTH NURSE'S FIRST INFORMATION ABOUT 733 INDIVIDUALS VISITED IN HOMES

Source	Infants	Preschool	School	Adults	Maternity	Totals	Per Cent
Report from Health Department or Official Organization	33	51	279	23	1	387	54
Tuberculosis Bureau		1	13	17		31	
Communicable Disease Bureau		36	40	5		81	
Birth Certificates	28	6				34	
Child Health Conference	2	4				6	
Toxin Antitoxin Clinic		2	3			5	
Health Officer				1		1	
School Medical Service			166			166	
Teacher	1		36			37	
Social Service Department	2	2	13		1	18	
Director County Health Camp			4			4	
Public Health Nurse School Inspection			4			4	
Home Visit to Other Members of Family	35	66	43	19	6	169	24
Mother in Prenatal Period	30					30	
Mother in Prenatal Period for Sibling		19	13			32	
Maternity Patient				3		3	
Infant		14	8	2	1	25	
Preschool Child	3		2		4	9	
School Child	2	29		6	1	38	
Adult		4	20	8		32	
Request from Non-Official Individual	1	20	20	19	8	68	9
Neighbor	1	19	20	11	4	55	
Member of Nursing Committee		1		8	2	11	
Telephone Operator					1	1	
Practical Nurse					1	1	
Patient's or Parent's Request	3	12	23	15	6	59	8
Physician's Request	1	9	4	12	7	33	5
Unknown	2	10		5		17	
TOTALS	75	168	369	93	28	733	
Total Known Classification						716	100

GENERAL TYPES OF HOME VISITS

In order to describe more clearly the work of the generalized public health nurse in an official health administration, it is desirable to

classify the home visits into some such categories as the following:

1. Single health education visits
2. Case visits
3. Bedside care visits

These categories may be defined thus:

Single Health Education Visit—This type of visit, peculiar to the nurse in the official organization, may be, for want of a better term, classified as the departmental call or the single health education visit made as a health department representative. It is illustrated by the single home visit made to a reported case of communicable disease, the 1 visit to an infant following the birth certificate report, or a visit to a school child to urge the correction of a physical defect.*

Case Visit—Case visits or the more or less intensive and repeated home visiting to disseminate health information and give health supervision for 1 or more members of the family, such as: the maternity case, visited several times in both the prenatal and postpartum periods; or the preschool child who presents nutritional and behavior problems; or the tuberculosis case and family contacts, all of whom require careful routine observation and supervision.

Bedside Care Visit—The visit in which bedside care is given at the time of illness, either in a case of emergency or to demonstrate to the family how to care for the patient.

The single home visit or departmental call is made necessary by the requirements of the health department program. If each nurse serves a population of 4,500, it is impossible for her to make repeated visits and give intensive health supervision to all cases with which she comes in contact. Since all types of visits were included in the sample of records collected, it was possible to make the analysis shown in Table VI, according to the amount of visiting to an individual. In this sample of records, 56 per cent of the individuals visited received single health education calls. This fact is sufficient evidence of the necessity for taking into full account this type of visit when studying the activities of the nurse in the official health department.

Since the sample of records used represents only a cross-section of home visiting for 6 months, an analysis as related to particular cases must of necessity be reserved until more complete data are collected.

* More than 1 visit might be desirable or ideal, according to accepted or proposed *standards*, for any one or many of the individuals in this group. It is impossible, however, for the nurse in the official health department to give continued supervision in the form of repeated home visits to all the individuals or patients with whom she comes in contact; therefore a selection is necessary. Several visits are, of course, made to some cases of communicable disease, to certain school children whose defects need correction, and to some infants whose birth certificate first informed the nurse of their existence; but the fact remains that there is a large group who receive only a single visit.

TABLE VI

INDIVIDUALS IN SPECIFIC AGE GROUPS, CLASSIFIED AS THOSE RECEIVING EITHER A SINGLE HEALTH EDUCATION CALL, OR REPEATED FOLLOW-UP VISITS FROM THE PUBLIC HEALTH NURSE

Age Group	Number of Individuals			Per Cent of Individuals		
	Receiving Several Follow-up Visits*	Receiving Single Health Education Visit†	Total	Receiving Several Follow-up Visits*	Receiving Single Health Education Visit†	Total
Infant	60	15	75	80	20	100
Preschool	80	88	168	48	52	100
School	124	245	369	34	66	100
Adult	37	56	93	40	60	100
Maternity	21	7	28	75	25	100
TOTALS	322	411	733	44	56	100

* As revealed by "case histories."
† As revealed by "call slips."

Our sample, however, throws some light on the sort of information that an analysis of records of this kind may yield.

There were 129 school children (in households where only school children were visited) who received a single home visit for the purpose of urging the correction of a physical defect found at the time of the school medical examination. The results of these visits are tabulated in Table VII. Subtracting from this total group the 26 instances where, as far as the public health nurse was concerned, the problem had been met, namely, "corrections had been made" (11), "children were receiving treatment" (6), "private physician or dentist had

TABLE VII

RESULT OF PUBLIC HEALTH NURSES' SINGLE HOME VISITS TO SCHOOL CHILDREN TO URGE CORRECTION OF PHYSICAL DEFECTS

Result	No. of Children	Per Cent
Corrections had been made	11	9
Children were receiving medical or dental treatment	6	5
Parents reported that physician or dentist had been consulted and said corrections were not necessary	9	7
Parents promised to have corrections made	55	43
Parents stated they could not afford to have corrections made	34	26
Parents refused to consider having corrections made	13	10
TOTAL*	128	100

* Excluding 1 child for whom result of visit was not recorded.

reported correction not necessary" (9), and the 1 case of unknown classification, leaves 102 instances of this problem. Of these, 34 or 33 per cent stated they could not afford to have corrections made. Since the nurse cannot usually offer free dispensary or clinic service, she is handicapped at this point, and a very definite problem is presented. This leaves 68 instances where the result of a single visit might be classified as successful or not successful, the former recorded as "Parents promised to have corrections made" in 55 or 81 per cent of the 68 cases, and the latter as "Parents refused to consider" in 13 or 19 per cent. If so considerable a proportion of parents were found to be non-coöperative, a definite problem in health education would present itself.

A similar kind of information is given in Table VIII in which are tabulated the results of public health nurses' home visits to preschool children for the purpose of urging protection against diphtheria by toxin-antitoxin. Of the 74 known as to classification there were 8 who had had the treatments, leaving 66 to be analyzed in terms of success or failure of the nurses' visits. If we consider the parents' promise to take the child either to clinic (29) or to private physician (7) as satisfactory, there were 35 or 53 per cent successful "results." The parents' refusal in 16 or 22 per cent might be classified as unsuccessful and the 15 or 25 per cent in which the parent promised to consider the matter as "cases to be followed up." In this instance the free toxin-antitoxin clinic eliminates the possibility of children not having protection against diphtheria because their parents cannot afford to pay for the treatments.

A comparison of the "results" in these two phases of the work shows that even with the facility for free treatment in the case of toxin-

TABLE VIII

THE RESULT OF PUBLIC HEALTH NURSES' HOME VISITS TO PRESCHOOL CHILDREN TO URGE TOXIN-ANTITOXIN

Result	No. of Children	Per Cent
Child had had the treatments	8	11
Parents promised child would attend clinic	28	38
Parent promised to take child to private physician for treatment	7	9
Parent promised to consider the matter	15	20
Parent refused to allow child to have treatment	16	22
TOTAL*	74	100

* Excluding 7 children for whom result of visit was not recorded.

antitoxin there is a higher percentage of unsuccessful visits for "TAT" than for "correction of defects." This is to be expected, perhaps, since the toxin-antitoxin represents the newer phase of prevention as against the older idea of correction; but the fact suggests a specific direction in which further emphasis may be given in health educational work.

That all infants visited by the public health nurse received more or less of a certain routine service in the form of, (1) advice to the mother regarding the general care and feeding, (2) an invitation to attend the Child Health Conference, and (3) an explanation of the need for and value of preventive measures such as toxin-antitoxin, does not seem too great an assumption, but a more complete indication of the results of such service is given in a sample record of what the nurses actually accomplished. The records of 75 infants visited during the 6 months showed that only 25 per cent had attended the Child Health Conference, and 25 per cent had received toxin-antitoxin. Some of the infants may have received only a single visit from the public health nurse, at which time but one problem was discussed. Perhaps many of the infants who had not had toxin-antitoxin were only 1 or 2 months old, and some of those who had not attended the Child Health Conference may have been under supervision of private physicians. The point to be considered is the reason why a larger percentage of success was not possible, and this will be attempted later in a more complete analysis related to particular cases.

Another type of visit which is influenced by the official organization is that in which bedside care is given in illness. This type of service is not included in the program of many official organizations, but in the rural sections of Cattaraugus County, where there are no

TABLE IX

HOME VISITS BY PUBLIC HEALTH NURSES TO GIVE BEDSIDE CARE

Age Group	Number of Individuals Visited	Total No. of Visits	Distribution of Visits		
			1	2–4	5–7
Infant	7	24	3	1	3
Preschool	7	7	7		
School	9	11	8	1	
Adult	20	88	11	4	5*
Maternity	6	16	3	2	1
TOTAL	49	146	32	8	9

* One had 16, one 19 and one 21 visits.

other agencies to which cases can be referred, the County Health Department offers bedside care either in a case of emergency or as a demonstration to teach the family how to care for the person "sick in bed." In the sample of records analyzed, the number of individuals who received bedside care (49) represents 7 per cent of the total visited, and the number of visits (146) for this purpose, 10 per cent of the total visiting. Table IX shows the number and distribution of visits.

TABLE X

DESCRIPTION OF BEDSIDE CARE GIVEN TO 20 ADULTS

No. of Adults	Condition or Need for Care	Actual Service Given at Time of Home Visits	Total Number of Visits
		One demonstration visit to teach a member of the family to give care:	
5	Old Age—Bedridden	Gave bath, made bed, made patient comfortable. Demonstrated care necessary to prevent bed sores.	5
2	In Automobile Accident	Gave bath, applied wet dressing to cuts and bruises as per physician's orders.	2
2	Erysipelas	Gave bath, applied dressing to affected areas, demonstrated isolation technic to practical nurse who was caring for the patients.	2
1	Injured Finger	Applied first aid dressing to finger.	1
1	Measles	Gave bath, changed bed, made patient comfortable and demonstrated isolation technic.	1
		More than 1 visit, emergency situations. No adult in home to care for patient:	
1	Tonsillitis	Swabbed throat.	2
1	Acute Intestinal Disturbance	Gave bath, made patient comfortable.	2
1	Nephritis	Gave bath, prepared special diet ordered by physician.	3
1	Old Age—Heart Condition	Gave bath, changed bed, made patient comfortable, took pulse and temperature, reported condition to physician.	4
1	Old Age—Paralysis	Gave bath, made patient comfortable (patient moved to hospital).	5
1	Pneumonia	Gave bath, applied pneumonia jacket, took temperature and reported to physician.	5
1	Cystitis	Gave bladder irrigation.	16
1	Tuberculosis	Gave bath, changed bed, sterilized dishes (advanced case).	19
1	High Blood Pressure	Gave general hot pack (lasting one hour).	21
20		TOTAL	88

Adults constituted over 40 per cent of the individuals who received this type of service, and to illustrate the possibilities of drawing a more intimate picture of the work, a description of the actual services rendered to these 20 adults is shown in Table X.

SUMMARY

The increasingly important part which the public health nurse is taking in all of the activities of the official health department organization is sufficient evidence of the need for careful analyses of the nature of her work, appraisals of its results, and a critical consideration of the directions in which it can develop most fruitfully.

The necessary records for such a consideration are not ordinarily available in the purely administrative reports. Without adding to the burden of record keeping, the nurses' reports can be revised in such a way as to make the desired information available.

In the course of certain studies of the work of the official public health nurse, a preliminary consideration of a sample of records from Cattaraugus County, representing the actual experience in home visiting of approximately the equivalent of 3 nurses for 6 months, suggests the usefulness of records of this kind. It was indicated that:

The nurses make home visits to 9 per cent of the total population in 6 months and probably about 14 per cent in a year.

Only 1 visit was made to 62 per cent of the families.

For 54 per cent of the people visited, reports or requests for visiting came through official channels, illustrating the selective influence of the organization machinery. In 24 per cent of the cases the individual was first known to the nurses by reason of visits to other members of the family.

The so-called single health education visit is made necessary by the requirements of the official health department program. Of the individuals visited 56 per cent received single health education calls.

An adequate, though simple, record of the " results " of home visits reveals the nature of problems to be attacked by the health department. For example, it was found that in 23 per cent of cases visited for correction of defects the family stated that they could not afford to have the corrections made, thus suggesting a problem in economics. About 20 per cent of the cases revealed uncoöperative families, suggesting the need for further health education.

The precise character and extent of the bedside care given by rural public health nurses can be depicted by adequate records of what is done in such instances.

REFERENCES

1. Mustard, H. S., M.D. *Cross-Sections of Rural Health Progress*, The Commonwealth Fund, Division of Publications, New York, p. 10.
2. Seventh Annual Report (Cattaraugus County Department of Public Health): *Public Health in Cattaraugus County, 1929*, p. 63.

Fiji Carries on for the Children

FIJI Island mothers staged a child-welfare meeting at the Agricultural Show held last year in Suva, Fiji, according to a report by Dr. Regina Flood-Keyes Roberts, the wife of the American consul at Suva. Dr. Roberts carries on volunteer child-welfare work in the vicinity of this capital of a British possession. She reports that two Fijian students at the Central Medical School are now being trained by her for the work, accompanying her on her rounds of the villages. Senior students are also invited to go with her on these visits. A student trained last year was, on graduation, assigned a district, and he is reported to have been doing good work.—U. S. Children's Bureau, Washington, D. C.

Diphtheria Prevention in Detroit*

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AND CARL E. BUCK, Dr. P. H., F. A. P. H. A.

Commissioner of Health, and Deputy Commissioner of Health and Executive Officer, Detroit, Mich.

THE question of diphtheria prevention in Detroit is a very serious one, for we have today the highest diphtheria death rate of any large American city. Detroit started its diphtheria prevention work in the year 1921 by offering diphtheria protective treatments, in the schools, to those children whose parents would consent to have them protected.

There was a gradual increase in the number of children protected, mostly school children, until the year 1926 when there was a very pronounced rise. This increase was due primarily to two reasons—(1) More money was spent upon diphtheria prevention that year, with the establishment of a large number of clinics. (2) This was a year of high incidence of diphtheria and a very serious form of the disease made its first appearance.

There was a pronounced drop in the number of immunizations against diphtheria in 1927 and a further drop in 1928. This falling off in number of children protected may be attributed to two factors—(1) The high incidence and severe diphtheria of 1926 having passed, the scare was over and people began to lose the fear of the disease which had been aroused during the preceding year. (2) The most easily reached portion of the population had already had their children protected. We were beginning to run into that group of parents which is more difficult to rouse to action.

In the year 1928 it was felt that sufficient educational work had been done on diphtheria prevention to warrant placing the entire responsibility for giving diphtheria preventive treatments and the Schick test in the hands of the practising physician where we believe it rightfully belongs. The details of the plan and how it is working out will be described.

In view of the fact that the plan of turning over to the physician the responsibility for diphtheria prevention is only part of a definite

* Read before the Health Officers Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

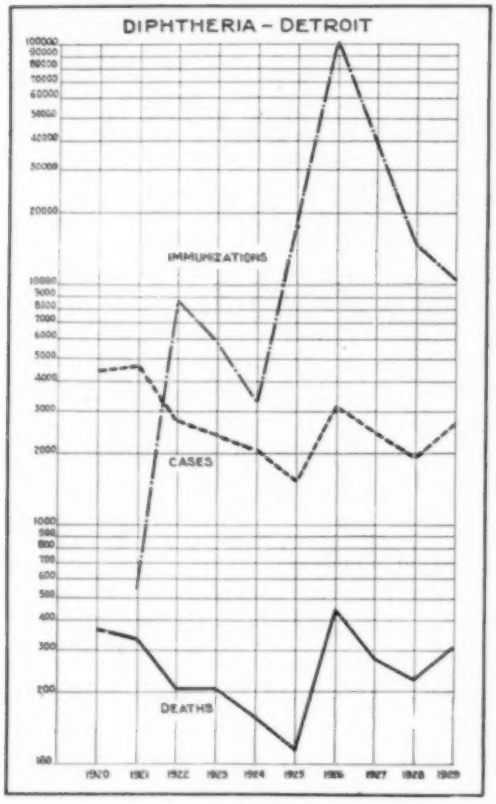

FIGURE 1

policy to which we hold, it may be wise to digress for a moment and describe this policy.

If we agree that the goal toward which we are aiming is universal participation in procedures of preventive medicine and health promotion, then some group or groups of individuals must be prepared and ready to meet the demand for service which this goal would entail. To put it more simply, if we expect all persons, young and old, to do the things which we think they should to prevent disease and maintain good health, the services indicated will have to be supplied by some group or groups of individuals. It is our contention that it is unreasonable to expect any large reasonably well-to-do community itself to supply sufficient funds and personnel to provide all the services necessary to insure universal participation in the field of preventive medicine and health promotion. From whom then can these services be obtained, except from the private physician, dentist, nutritionist, psychiatrist, etc.? If these hypotheses are well founded the official health organization has two important functions to perform.

1. To create a demand on the part of the people of the community for well proven scientific procedures of preventive medicine and health promotion.

2. So to coöperate with the medical and dental professions that the services will be adequately provided when the demand arrives. This means in effect that the health organization must take the message of preventive medicine and health promotion to the practising physician and dentist to the end that they may become better able, willing and anxious to participate in this type of work.

The diphtheria prevention program in Detroit is in keeping with this policy. Having carried on clinics for diphtheria protection continuously for 8 years we felt that the value of this service had been well demonstrated. The majority of the people in the community had

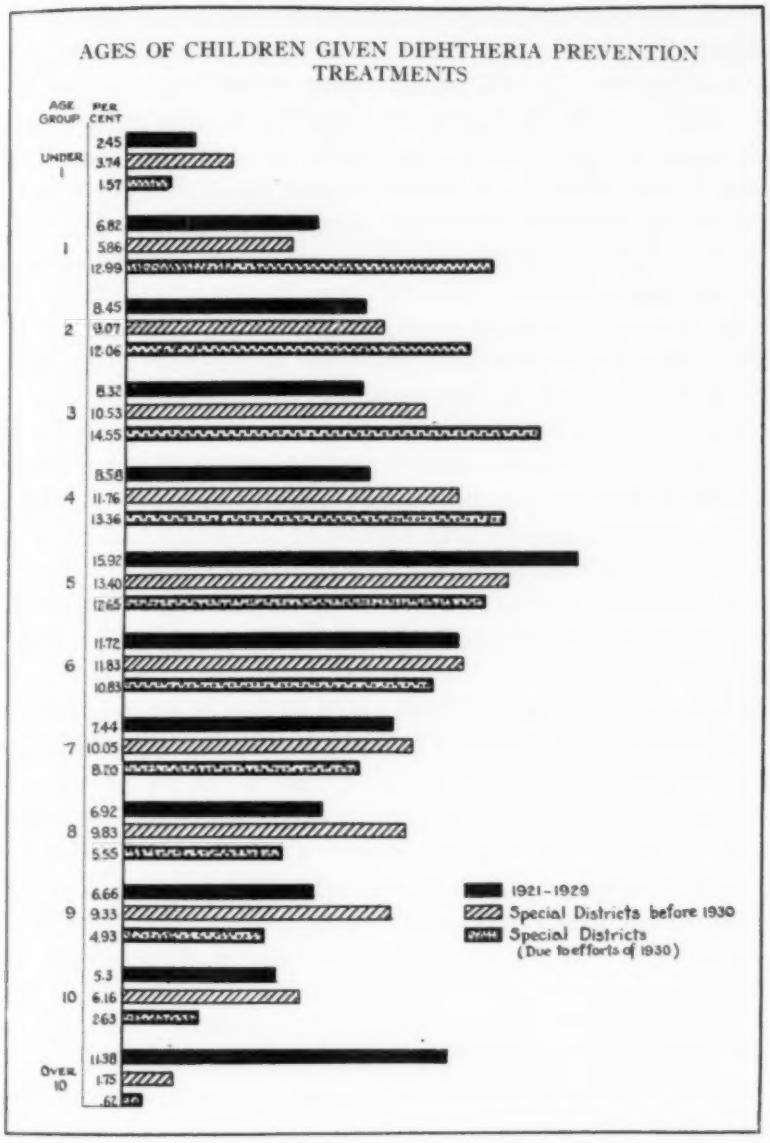

FIGURE II

learned that diphtheria is a definitely preventable disease and that the means of obtaining protection is simple and harmless.

During the summer of 1928 a coöperative plan was worked out between the Department of Health and the local medical society whereby, beginning in October, 1928, the physicians of the city agreed to give all diphtheria prevention treatments and Schick tests. The physicians also agreed to sign for toxin-antitoxin and Schick material

taken from stations (the Department of Health established 8 stations from which these materials could be obtained day or night), and to report work done. Postal cards upon which the Department of Health would pay the postage were supplied for this purpose. There are two types of card, one for the Schick test and the other for toxin-antitoxin. The physician is asked to take from the station at which he receives his material the same number of toxin-antitoxin postal cards as he takes c.c. of toxin-antitoxin in order that each dose may be reported separately.

At first thought it would seem expensive and unnecessary to have a separate report for each dose given but it was felt, after discussing the matter with a good many physicians, that more complete and accurate reporting would result if the physician could merely write on a card the name of the child, address, age, and check the dose given, drop the card in the mail and forget about it until the next dose, rather than that he should be asked to keep record of the doses and report at the end of the series of treatments.

In the original plan of 1928, the physicians agreed to give diphtheria prevention treatments for a reasonable fee or free of charge to those unable to pay.

For its part, the Department of Health agreed not to give any toxin-antitoxin or Schick tests; but to carry on the educational propaganda necessary to give impetus to the work—news stories, paid advertisements, posters, lectures, radio talks, and the distribution of literature; to distribute toxin-antitoxin and Schick material and postal cards upon which reports could be made; to keep records of work done; and to reimburse physicians at the rate of $.50 per injection of toxin-antitoxin or $1 for the Schick test for work done for patients unable to pay.

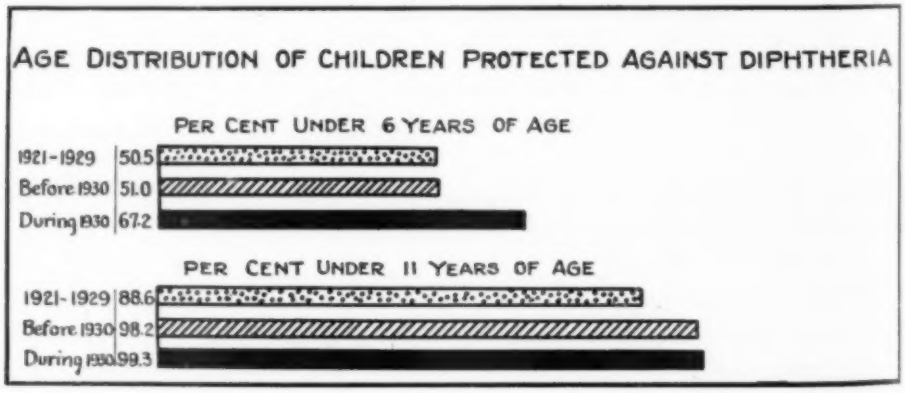
AGE DISTRIBUTION OF CHILDREN PROTECTED AGAINST DIPHTHERIA
PER CENT UNDER 6 YEARS OF AGE
1921-1929 50.5
Before 1930 51.0
During 1930 67.2
PER CENT UNDER 11 YEARS OF AGE
1921-1929 88.6
Before 1930 98.2
During 1930 99.3

FIGURE III

This, then, was the plan in 1928. Certain mistakes were made at that time which have since been rectified. For example, in the original program the medical society pledged the physicians of the city to the agreement and all physicians were given written notice of the agreement and plan but only a comparatively small number of them were actually seen and talked with concerning it. The result was that many physicians did not know the details of the plan, except as they may have read it in the letter which was sent them, and probably many of them did not even read it, and not being familiar with it were not entirely in sympathy.

During this first year of the program, children were sometimes referred to physicians who did not believe in diphtheria protection and in some instances they got into the hands of physicians who charged exorbitant fees. While such instances were not especially numerous, they did mitigate against the success of the program. We (that is the Department of Health and a small group of influential and prominent members of the local medical society) were deluded into thinking that we had "sold" the idea to the medical profession as a whole, when as a matter of fact only a small percentage of the physicians of the city knew much about the plan. It is only human nature for an individual to be against a program about which he knows little or nothing.

With the conviction of this error in mind—and this error is, by the way, the one most commonly made in attempting coöperative programs with the medical profession—in 1929 a letter was sent to each physician of the city asking whether he cared to coöperate in the diphtheria prevention program. If he agreed he was asked to fill out a questionnaire, which was enclosed with the letter, and return it to the Department of Health.

As an immediate response to this letter, approximately 700 physicians signed the questionnaire indicating their willingness to accept children for diphtheria protection, at certain hours specified by them, for $1 per dose or free of charge for all those unable to pay. Since the original letter, the number of coöperating physicians has grown to nearly 900, which represents approximately 85 per cent of the total number of physicians in the city who might be in a position to participate actively in diphtheria prevention work.

In spite of the fact that the plan had been presented in detail in writing and that each physician had signed a written agreement to participate actively in the program, we nevertheless realized the necessity for having personal contact with as large a number as possible. Accordingly we took every opportunity of addressing meetings of medical groups. Not only was the local medical society itself addressed

QUESTIONNAIRE

If you are interested in the continued abolishment of free diphtheria prevention clinics, please read this notice.

Physicians' Diphtheria Prevention Campaign

Name ..... Telephone .....

Address .....

Regular Office Hours: A.M. from ..... to ..... Special Diphtheria Day

P.M. from ..... to ....

Mon. Tues. Wed. Thurs. Fri. Sat. Sun.
(Please check day set aside)

Hours from ..... to .....

..... to .....

In order to help wipe out diphtheria, I agree to administer 3 injections of toxin-antitoxin in my office for the following fees:

I will set aside special hours day a week (as noted above) for toxin-antitoxin injections, charging for each such injection during those special hours a fee of $1.00.

If I cannot set aside special hours for toxin-antitoxin injections, I am willing to give the injections during my regular office hours at a rate of $1.00 for each injection of toxin-antitoxin.

Be sure to designate clearly the day or days and hours during which you will be willing to accept patients for toxin-antitoxin and Schick tests

I further agree to immunize such children whose parents cannot afford to pay for such service, free of charge to them. For such service, upon receipt of proper statement, the Department of Health agrees to reimburse me at the rate of $.50 for each injection of toxin-antitoxin and $1.00 for the Schick test including its reading.

I consent to the inclusion of my name in a list of doctors who, as an additional contribution to public health, agree to administer toxin-antitoxin for the above fees. This list is to be used by the Health Commissioner, or the Wayne County Medical Society, or others designated by them, for the purpose of directing parents who are not attached to regular doctors and to encourage those who can pay for their medical service to do so.

I further agree to sign for all toxin-antitoxin and Schick test material taken and to make report to the Department of Health on use made of it on post cards provided for this purpose.

Date ..... Signed ..... M.D.

P.S. Failure to receive word from you will be assumed to indicate that you do not care to have your name included among those coöperating in the Diphtheria Prevention Campaign.

The Public Health Committee of the Wayne County Medical Society
coöperating with the Detroit Department of Health

(Use Other Side for Any Comment)

on diphtheria prevention, but short talks on the subject were also given at several successive meetings of each of the branch medical societies.

Advantage was also taken to present the subject at hospital staff meetings. In addition three separate meetings were held to which the coöperating physicians were invited. These meetings were held at our own hospital and refreshments were served. At each meeting the plan was discussed in detail and changes made in accordance with sug-

gestions received. The Schick test was demonstrated and a number of children, who had been Schicked, were present to permit reading of the test. In all, about 260 of the 700 coöperating physicians (there were 700 at that time, there are now about 900) came to one or another of these meetings.

In 1930 arrangements were made for a large series of neighborhood meetings in which one physician invited ten or a dozen of his colleagues in the neighborhood to come to his house or office to discuss plans for greater participation on the part of the practitioner of medicine in the field of preventive medicine and health promotion. A definite and carefully worked out program with clinical material for demonstration was presented at each of these meetings. It is our belief that some such system as this is the only feasible means of bringing about effective participation in the field of preventive medicine and health promotion on the part of physicians in urban communities pending the time that these subjects are more adequately taught in medical schools.

This, then, without going into too great detail, is the policy of diphtheria prevention which is being carried on in Detroit today. Perhaps even more encouraging than the actual results of the program to date is the attitude of that group of physicians who have been most closely associated with the plan. This group has shown not merely an interest but a very enthusiastic active interest in diphtheria prevention and in the entire field of public health.

What have been the results and what do we hope eventually to accomplish?

Beginning in 1921, diphtheria protection was given in schools to those children whose parents were willing to have them protected. In spite of the fact that diphtheria was high that year, only a few children were immunized, as might be expected, for long time protection against diphtheria was at that time a relatively new thing to the public. This same program of giving diphtheria prevention in schools was carried on through the year 1925 with gradual increases in the number of children immunized. In 1926, diphtheria became unusually prevalent and much of it was of a very severe type.

In that year the Department of Health not only carried on its work in the schools but also opened 18 free clinics in strategic parts of the city and launched an extensive publicity and advertising campaign. People were frightened and the number of immunizations rose to 106,000, the largest number to be protected in any single year. It is interesting to note that during the next year, 1927, with diphtheria far less prevalent but with the same number of free clinics and with an equal, if no greater, expenditure of funds and effort devoted to pub-

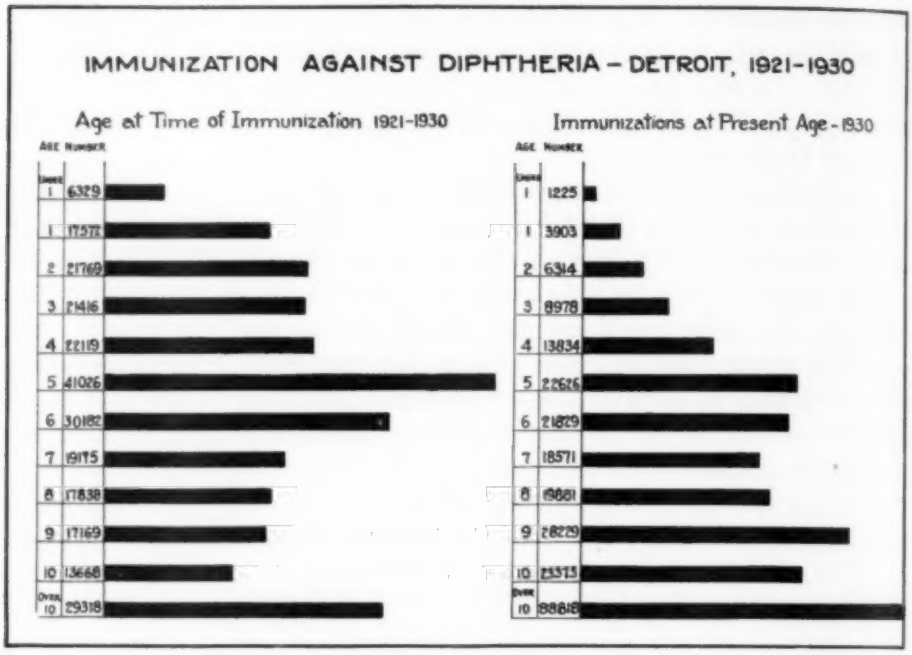

FIGURE IV

licity and advertising, the number dropped to 38,800, only slightly more than one-third the number immunized during the preceding year. There was a still further drop in numbers protected during 1928.

In the fall of 1928, the present plan of having all the work of giving diphtheria preventive treatments and Schick tests done by the practising physicians was instituted. We have already pointed out some of the mistakes that were made at the inception of the plan, and the methods by which we have attempted to correct them. Numbers protected during the first two years of this program were not great but in 1930 the number protected exceeded 50,000, which is the greatest number reached in any year except 1926, when diphtheria was unusually prevalent and severe.

The increase in numbers protected in 1930 may be attributed principally to two factors: (1) A thoroughly awakened interest on the part of the physicians of the city to have children protected against diphtheria, and (2) a change in method of persuading parents to have their children protected. The increased interest on the part of physicians is due to the fact that an ever increasing number of them are becoming thoroughly familiar with and, therefore, sympathetic toward the program.

The year 1930 saw a decided change in the method of persuading parents to have their children protected. From 1921 through

1925, diphtheria prevention was undertaken only in the schools and most of the children reached were of school age. Notices were sent home to parents asking permission to immunize their children, but no extensive publicity campaign was carried on. In 1926 and from that time on, increasing emphasis was placed on the necessity for having preschool children protected. From 1926 through 1929, a very extensive publicity and advertising campaign was in operation. It may be well, at this point, to differentiate between a diphtheria prevention program and a publicity and advertising campaign. Our program for protecting children against diphtheria is a continuous one, going on throughout the year and from year to year. Publicity and advertising campaigns, on the other hand, are carried on for short periods of time, usually in the fall, to give impetus to the work of diphtheria prevention.

Publicity and advertising include news stories, paid newspaper advertisements, outdoor bill boards, posters in street cars, stories in foreign language and neighborhood papers, moving pictures, lectures, radio talks, and the distribution of literature on the subject. Pamphlets are distributed through schools, clinics, meetings, and are also enclosed with birth registration certificates. When a child reaches 6 months of age its parents are sent a letter advising immunization against diphtheria.

These intensive publicity and advertising methods succeed in arousing a certain group of the population to definite action. Children of parents in this group have, for the most part, been protected as a result of these publicity methods. There is another large group of individuals (whether this group is larger in Detroit than elsewhere we have no way of knowing, but it is in any event a large group) who cannot be aroused to action through the generally accepted channels of publicity and advertising.

In an effort to reach this group effectively, two rather large districts of the city in which diphtheria had been unusually prevalent and severe (the two districts comprising 18.3 per cent of the city's population had, in 1929, a total of 26 per cent of the city's diphtheria cases and 31 per cent of the deaths) were selected for an intensive house-to-house canvass by public health nurses, the object of which was to secure the immunization against diphtheria of children between the ages of 6 months and 10 years. This work was carried on during the summer of the present year, 1930. An average of 45 nurses devoted their entire time for 2 months to this project. So encouraging were the results (in all 62.57 per cent of the children whose parents were interviewed in those districts are now protected against diphtheria or

rather have completed their series of diphtheria prevention treatments) that it was decided to continue and enlarge this type of work.

In order to permit the enlargement of this project it was decided to postpone certain phases of health work that could be temporarily postponed in order to release personnel for diphtheria prevention work. The city was divided into 15 large districts (exclusive of those districts in which intensive work had already been carried on), and 112 nurses were assigned to diphtheria prevention work in these districts. This project commenced on October 20 and for the next 4 months these nurses devoted their efforts toward securing the immunization of all children between the ages of 6 months and 10 years. They called in all homes throughout the city where there were children of this age group. Coincident with this actual interviewing of parents the usual publicity and advertising were carried on.

One of the daily newspapers sponsored a diphtheria prevention poster contest in which the Department of Health purchased the three winning posters for use in the diphtheria prevention program. Posters were judged not on artistic merit alone but also on their ability to portray diphtheria prevention. In order to make the nurse's interview as effective as possible, each nurse has been provided with not only a set of instructions as to the mechanical means by which the work is to be carried on, but also with a little pamphlet entitled "Questions and Answers," which answers the questions commonly

TABLE I

DETROIT'S PRESENT STATUS OF DIPHTHERIA PROTECTION

Ages	Detroit's 1930 Population	Original Ages of Children Protected		Present Ages of Children Protected	
		No.	Per cent	No.	Per cent
Under 1	30,063	6,329	21.0	1,225	4.07
1	32,424	17,572	54.1	3,903	12.03
2	32,738	21,769	66.4	6,314	19.28
3	33,525	21,416	63.8	8,978	26.78
4	34,155	22,119	64.7	13,834	40.50
5	32,424	41,026	126.5	22,626	69.78
Total Under 6	195,329	130,231	66.6	56,880	29.12
6	31,007	30,182	97.3	21,829	70.40
7	32,266	19,175	59.4	18,571	57.55
8	30,063	17,838	59.3	19,881	66.13
9	29,276	17,169	58.6	28,229	96.42
10	29,118	13,668	46.9	23,373	80.26
Total Under 11	347,059	228,263	65.7	168,763	48.62
Over 10		29,318		88,818	
Total		257,581		257,581	

asked about diphtheria protection, and a sheet of instructions for a "sales" talk on the subject. The slogan emphasized in all publicity and advertising was "Children Need Not Have Diphtheria." All correspondence of the Department of Health was stamped in red letters bearing this caption.

We have already shown the number of immunizations which were effected in each of the years since 1921. Starting with only 579 in 1921, the numbers increased to a high point of 106,000 in 1926, fell off again and reached a second high point of over 50,000 for 1930.

The changes in age distribution of children protected are interesting and significant.

To summarize very briefly, it is our opinion that the program of having the private practitioners of medicine give diphtheria prevention treatments has a number of distinct advantages over the method of having this work done in schools or clinics.

1. The policy is in keeping with the average American's desire to choose his own grocer, his own clothing and his own physician.

2. It tends to place the responsibility, for that particular phase of child health at least, in the hands of the parent where we believe it rightfully belongs.

3. It makes a substantial beginning in attaining the goal toward which we are aiming: a greater degree of participation on the part of the private practitioner of medicine in the field of preventive medicine and health promotion.

4. It has a cumulative educational effect on both patient and physician which does not obtain in the clinic system. For example, if in the immunization of 50,000 children by private physicians we have created even as few as 2,000 new contacts between family and physician, which contacts become enduring, and the physician becomes the family health adviser, we will have accomplished something of far more reaching effect than the immunization of 50,000 children against diphtheria, important as that is.

5. This system seems to result in the immunization of a larger percentage of the most susceptible age group, the preschool child.

Newer Knowledge on Botulism and Mussel Poisoning*

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SINGLE or group intoxications due to the ingestion of the toxin generated by *Cl. botulinum* and *parabotulinum* in various articles of food continue to be reported. With the exception of the annual reviews published in the *Journal of the American Medical Association*,[1] no statistical data have appeared on the subject of botulism since 1922.[2] It may therefore be of interest to review briefly some of the data collected during the past 10 years. In Table I the annual distribution of botulism is summarized.

In this connection it must be pointed out that no claim for completeness can be made on account of the well known fact that inquiries instituted in the course of the investigation of an outbreak of food poisoning not infrequently elicit histories of similar occurrences which have taken place in the same community or vicinity several years before. Unfortunately, botulism is only reportable in 13 states (Arizona, California, Colorado, Connecticut, Idaho, Kansas, Maryland, New York, Minnesota, Oregon, Washington, West Virginia, and Wyoming. Single cases, or intoxications, only superficially studied by a coroner's department may be due to the ingestion of botulinus toxin, while reports of such cases have been given as due to botulism on insufficient evidence. Complete data on this disease are therefore not available.

For a number of years, particularly during 1926–1927, few authentic cases of botulism were reported, largely due to the after-effects of the flood of publicity which called attention to the possible danger inherent in inadequately sterilized or preserved, especially home-canned, food products. During the past 2 years, a definite increase has been noted and group intoxications involving 5 to 12 cases have again made their appearance. As a whole, people who could probably

* Read before the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

TABLE I

SINGLE AND GROUP INTOXICATIONS DUE TO BOTULISM
1899–1930

	Home preserved		Commercially preserved		Unkn own	Total
	Bacteriology proven	Bacteriology not proven	Bacteriology proven	Bacteriology not proven		
1899–1909	—	3	—	—		3
1910		2		1		3
1911	0	0	0	0	1	1
1912	1	2	0	2		5
1913	0	3	0	1	1	5
1914	1	1	1	0		3
1915	2	2	0	3	1	8
1916	3	2	0	0	2	7
1917	3	4	0	2		9
1918	3	9	0	1	1	14
1919	0	9	3	2	2	16
1920	1	3	4	2	1	11
1921	4	4	5	4	1	18
1922	11	6	1	1	4	23
1923	4	7	0	0	3	14
1924	4	4	2	2		12
1925	2	1	3	2	1	9
1926	1	2	0	0	0	3
1927	4	1	0	0	0	5
1928	3	3	0	0		6
1929	3	6	1 (Italian)	0	1	11
1930 (Sept. 30th)	0	5	0	0	—	5
Total	50	79	20	23	19	191

never be reached by any method of warning have been the victims of their own ignorance. With the exception of 2 cases of botulism traced to shalots (*Muscari commosum*) packed in Italy, home preserved vegetables, fruits, fish, and meats have been the products responsible. Commercially preserved food has not been connected with any of the recognized cases of botulism since 1925. Scientific canning procedures have replaced empiricism in practically every branch of the industry which packs products liable to botulinus spoilage. In the very near future, every type of food which is preserved by canning will either be subjected to such sterilization times and temperatures or to such processes of acidification and curing that the toxicogenic anaerobe will either be destroyed or its growth completely inhibited. Continuous vigilant supervision and far reaching education have been responsible for the removal of the botulinus menace from the commercial packing industry. The fundamental studies which enabled the industry to

apply scientific principles to the control of botulism have been published in a series of papers.[3]

The 191 single or group intoxications, collected over a period of approximately 30 years, involved a total of 625 people with 411 deaths. The case mortality rate has risen from 61.7 per cent in 1922 to 65.7 per cent in 1930. This exceedingly high rate is only surpassed by the figures (67.3 per cent) reported by Zlatogoroff and Soloviev[4] for the fish poisoning cases due to *Cl. botulinum* in Russia. The average mortality of the German mass intoxications, with the exception of 3 instances in which home-canned string beans were responsible, has remained approximately 20 per cent. These differences may be due partly either to the low toxicogenic properties of the non-proteolytic *Cl. botulinum* Type B, or to the nature of the foodstuffs involved in the intoxications. The moisture in the causative food is doubtless an important factor. The high mortality in the American string bean group intoxications finds its analogue in the fatality rate of the German vegetable poisoning cases reported by Landmann, Blumer and Wagner.[5] Meat and fish products with a high water content, in the form of pastes, soft sausages of the mettwurst variety, pickled fish, etc., have caused a higher mortality than hams or other relatively dry pork products in which the poison is unevenly distributed. Since approximately 88 per cent of the intoxications observed in the United States are caused by vegetables of various sorts preserved in brine, the possibility of ingesting a fatal quantity is considerably greater than in Germany where hams are the chief botulinogenic foods. Heat preserved canned foods are responsible for less than 5 per cent of the German botulinus intoxications.

As a rule the provisional diagnosis of botulism has been made without any difficulty, but it is noteworthy that the accuracy of the findings has only been confirmed by bacteriological tests in one-third of the observations. Attempts to determine the true nature of the poison doubtless have been made, but only too often the causative food either has been completely consumed or the remnants have been destroyed or discarded. In a few instances the clinical records have been confirmed by the demonstration of botulinus toxin in other containers of the same pack or the coincident occurrence of botulism in chickens.

The geographical distribution of the American outbreaks has changed only slightly. The rural sections of the western states (California, Washington and Colorado) continue to furnish the bulk of the observations. It is of interest that New York, with 10 single or mass intoxications, has taken 4th place, while such states as Oregon,

Idaho, Montana, North Dakota and Wyoming have recently contributed their share to the botulinus statistics. The data are in many ways interesting but it is here merely pointed out that botulism cases may be found with equal frequency in the eastern states provided an effort is made to investigate the distribution more carefully than has generally been the case.

The spores of *Cl. parabotulinum* are in the soil throughout the United States, England,[6] Germany, and France,[7] and have recently been demonstrated in specimens of mountain dirt collected from shalots in Southern Italy. In the light of the observations made in South Africa and of the findings reported by Kempner and Pollack[5] many years ago, it is not unlikely that certain varieties of the botulinus group (non-ovolytic *Cl. botulinum* Types B, C and D) lead a saprophytic existence in the intestinal canal of animals, as, for example, in hogs. Fecal and not soil contaminations may, therefore, confer on the food the dangerous botulinogenous properties.

The rather frequent occurrence of these varieties of *Cl. botulinum* in the bone marrow of cattle, lamziekte or hogs (the growth of spores in the marrow with diffusion of the poison through the foramina), lends considerable support to the interpretations of the few carefully studied observations. A search for non-ovolytic botulinus Types B and D in manure remains, however, futile until a selective enrichment medium has been devised. In this connection, it is recalled that the non-ovolytic Type C has been found in the United States but so far has not been connected with human cases of botulism. In all probability this is due to the fact that the toxin must be ingested in large quantities in order to cause intoxication in man. Type D has been isolated in South Africa and it is claimed that Types A and B are unknown in that country.[9] The Van Ermengen B strains have not, as yet, been found in the United States. The examination of many thousands of samples of soil, sewage, manure, etc., of American origin has never furnished indication of botulinus toxin producing anaerobes which resemble these Van Ermengen strains. Notwithstanding these negative findings it is not safe to conclude that the bacillus is not present on the North American continent. It is highly desirable that the ecological studies on the botulinus organism begun many years ago be continued in order to establish more conclusively the genetic relationship of the Types A, B, C and D.

In Table II the foods proved to be responsible for the 192 outbreaks are briefly summarized. Plant products were involved in 72 per cent of the cases, while 18 per cent of the outbreaks must be attributed to animal products. Home-canned string beans continue to

play a very important rôle, largely due to the well known fact that spoilage of this vegetable when preserved is so slight that the housewife or cook will often fail to detect it. Furthermore, string beans are frequently served as salads and any odor which might arouse suspicion is usually masked by the vinegar or mayonnaise dressing. Home-canned corn has also been a frequent offender.

Occasionally the monotonous character of these intoxications is changed by the occurrence of an observation in which an article of food rarely connected with botulism is a carrier of the deadly toxin. Plant or meat products supposedly immune from botulism spoilage have recently been definitely associated with fatal cases. Invariably the article of food was improperly preserved, that is, either under-processed or inadequately acidified. The factors responsible for the spoilage in Bartlett pears by *Cl. botulinum* have been studied.[10] It has been demonstrated that *Cl. parabotulinum* may generate and

TABLE II

FOODS INVOLVED IN OUTBREAKS OF BOTULISM, 1899–1930 (OCTOBER)

String beans	50	(3 commercially packed, not proven)	Green tomatoes	1	(home canned)
Corn	22	(1 commercially canned) (1 commercially packed, not proven)	Squash	1	
			Turnips	1	
			Pickles	1	
			Apricot butter	1	
			Peas (?)	1	(commercially packed, not proven)
Olives	14	(13 commercially packed) (1 home canned)	Persimmons	1	
			Shallots, Muscari	1	(commercially packed in Italy)
Spinach	12	(9 commercially packed, 4 proven direct, 1 indirect)		141	
Asparagus	9				
Beets	5	(2 commercially packed, 1 proven indirectly)	Pork products	10	
			Sea food	7	(4 commercially canned)
Apricots	3		Beef	4	
Pears	3		Sardines	2	(2 commercially canned)
Chili peppers	3				
Figs	2		Cheese	3	
Celery	1		Chicken	2	
Greens and turnip tops	1		Potted meat	1	
Home brew	1		Sausage	1	
Okra	1		Milk	1	
Pimentoes	1			31	
Yellow beans	1				
Salad dressing	1				
Succotash	1		Unknown (inclusive 1 home prepared food)	19	
Tomato catsup	1	(commercially packed?)		191	
Tomato relish	1				

elaborate a deadly poison in the cooked fruit irrespective of the acidity, provided certain bacteria or yeasts are growing concomitantly.

The observations of the past 10 years leave no doubt that all canning methods, whether commercial or home, should aim at absolute sterility of the product to insure freedom from *Cl. botulinum* or *Cl. parabotulinum*. In case this prerequisite cannot be met, acidification with citric acid, or with a mixture of acetic and citric acids, to a pH of at least 4.5 with subsequent heating of the product at 100° for a short period, should be practised. Such vegetables as artichokes, chilis, mushroom sauces, etc., can now be well preserved by the procedure of acidification.

From a public health standpoint it is imperative that the principles developed by the canning industry be applied to the methods of home canning. A vigorous, systematic program of continuous education may in time reduce or eliminate the many unnecessary deaths from botulism.

MUSSEL POISONING

After the serious outbreak of mussel poisoning[11] in July, 1927, in San Francisco and vicinity, in which 102 people, with 6 deaths, were involved, the problem of this intoxication was assigned to Dr. H. Sommer and his assistants. The question which deserved primary attention was to ascertain the time of year and the locality along the coast where the mussels would again be expected to become dangerous for human consumption. For this purpose a standard animal test which enabled the workers to examine mussels at frequent intervals was developed.* The result of the periodic examinations proved definitely that the Pacific Coast mussel (*Mytilus Californianus*) collected at various places from Monterey Bay in the south, to as far north as the mouth of the Klamath River, may contain a small amount of typical mussel poison at any time of the year.

To date very few samples have been tested outside of this area and therefore no definite conclusions can be drawn relative to the frequency of non-fatal doses of mussel poison in this shellfish in Southern California. Since mussels are consumed in large quantities without ill effects by the population along the coast, it is reasonable to conclude that the "slightly" toxic mussels are not important from the standpoint of public health.

During the months of July and August invariably the mussels become highly toxic and dangerous for human consumption. In 1928 "moderately" poisonous mussels were found from July 20 until Au-

* To be published.

gust 9 in one locality 50 miles south and in another 50 miles north of San Francisco. No human cases occurred during this season. The mussels collected between July 10 and August 14, 1929, from Pescadero to the mouth of the Russian River proved "moderately" to "very strongly" poisonous. These findings were promptly paralleled by the occurrence of 56 human poisoning cases between July 7 and August 6. Fortunately, only 1 of the intoxications proved fatal.

The outstanding observation of the 1929 outbreak of shellfish poisoning was, however, the occurrence of the cases of August 4 which were due to the eating of Washington clams. Three of the cases proved fatal. Subsequent animal experiments on clams showed that 7 of the 8 varieties examined were highly toxic, and especially the 2 large species, *Saxidomus nuttallii* (Washington clam) and *Schizothaerus nuttallii* (Horseneck clam), which contained a large amount of poison. The clinical observations as well as the laboratory findings indicate that the clam poison is a substance very similar if not identical with that of the mussel.

In midwinter, 1929–1930, "moderately" toxic mussels were collected north of Bodega Bay, and again in March, 1930, at Point Reyes. The latest findings during the summer of 1930 are entirely in accord with the experiences of the past 3 seasons. The mussels reached a degree of toxicity designated as "moderate" to "strong" from July 8 until August 22, with a maximum of "very strong" on July 26 near the mouth of the Russian River. On July 27 1 human case of mussel poisoning occurred in that vicinity. Of the clams tested *Saxidomus nuttallii* contained a small amount of toxin. The beds from which the mussels were gathered are all exposed to the open shore line subject to the ebb and flow of the tides, and, with one possible exception, never exposed to pollution by sewage. It is therefore noteworthy that in the course of the investigations it has repeatedly been demonstrated that the mussel poison cannot be detected with certainty in the San Francisco Bay mussels (*Mytilus edulis*) nor in the clams (*Mya arenaria*) of the same region.

In a score of other mollusks, echinodermata, and miscellaneous specimens collected in the vicinity of the mussel beds of the coast, no definite shellfish poison was demonstrated, although many of the samples exhibited a harmful action on the test animals. Toxic extracts with properties distinct from mussel poison have been obtained from fish eggs (crotus), starfish and chitons (*Mopalia muscosa*). These investigations required a special procedure.

The wet, dry and skeleton weight of the various shore animals had to be estimated, and the toxicity of the various solutes of sea water had

to be investigated since poisonous magnesium salts seriously interfered in the animal experiments when the extraction of the marine material was not carefully controlled. Numerous observations indicate that the mussels under water are often more toxic than those found above the mean water level. The maximum toxicity seemed to occur soon after or during the maximum tides of the year. In July and January, epidemiological as well as laboratory studies tend to indicate that the factor which renders the mussels poisonous begins to operate south of the Golden Gate and travels north. The influence of oil formation, influx of detritus, unusual odors, luminescence, turbidity and color of the water, changes in temperature, etc., have been recorded. However, their connection with the phenomenon of mussel poisoning has not as yet been successfully established.

The toxic mussels may have a typical odor of cyanide which in most cases is, however, very faint. The hepato-pancreas of the harmful shellfish usually is larger and softer and is often of a greenish color, lighter or darker than the normal digestive gland. Experience has shown that these anatomic and metabolic changes may allow a differentiation of the innocuous from the harmful specimens.

In most cases the occurrence of mussel poisoning coincided with the spawning season although the two phenomenons do not run strictly parallel. *Mytilus Californianus* has been found to spawn in midsummer, in midwinter, and in certain localities during the spring. At least in the San Francisco Bay region the mussels pass through two spawning seasons during the year, and detailed histological examinations of toxic and non-toxic mussels have not revealed any consistent differences, though the studies are still in progress. In this connection a study of the sea water in amounts up to 3,000 liters was undertaken. The water was filtered and the plankton examined and tested for toxicity. During, as well as before and after, the toxic period, microorganisms of the ocean water were found to contain neither shellfish poison nor other similar toxins.

Attempts to produce poisonous mussels by exposure, suffocation, etc., at various temperatures in and out of sea and fresh water have thus far failed. A slight formation of poison may take place when mussels are treated with illuminating gas. Cyanide is without effect on the toxicity of the mussels. The ability of shellfish to store poisons has repeatedly been demonstrated, particularly in experiments with strychnine.

Preliminary pharmacological investigations with a purified shellfish poison have given the following prominent results: Slowing of respiration after small doses; violent dyspneic movements, and respira-

tory failure after injection of lethal doses. The action on the blood pressure is complex and consists in general of a depression followed by a secondary asphyxial rise. The initial effect on the heart rate is characterized by an increase with subsequent slowing of the beat. The heart continues to function slowly after respiration has stopped. The poison is rapidly excreted through the urine (30 per cent in 2 hours). Amiodoxyl does not oxidize the poison *in vivo* or *in vitro*. Injections of caffeine rather hasten the death caused by shellfish poison, probably on account of the increased rapidity of absorption.

As a precaution against occurrences of mussel poisoning, the State Department of Public Health regularly issues a warning against the use of mussels during the period when they are particularly liable to be dangerous. Their sale has been forbidden during the past 2 summers. The quarantine is only lifted after repeated tests of numerous mussel beds have shown that the mollusks are "slightly" or non-toxic.

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Diphtheria Prevention on a State-wide Basis and the Part the Public Health Nurse Has Taken*

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WHO shall say where or how the best toxin-antitoxin campaign has been developed; and would such a statement help the further development of the project to any great extent? We have chosen to outline certain experiences in developing toxin-antitoxin campaigns in New York State, because that is the territory with which we are most familiar.

The diphtheria prevention program on a state-wide basis became a joint major activity of 5 state-wide official and nonofficial organizations in January, 1926, and has remained so for 5 years. The New York State Department of Health provided official direction and organization service and advice through its field workers, and supplied toxin-antitoxin mixture free to local health departments and to private physicians. The State Department of Education secured the interest of local boards of education, of school medical inspectors, of school nurses and school teachers, and issued a statement to all parents and all school authorities asking their help to eradicate diphtheria.

The Metropolitan Life Insurance Company through its Welfare Division gave financial support, supplied a huge amount of excellent free literature, moving picture films, statistical service, and special speakers both for radio broadcasts and for local groups. The company solicited the active participation of its field agents, local district managers, medical examiners and visiting nurses. The State Committee on Tuberculosis and Public Health of the State Charities Aid Association put its long years of experience in health promotion through local organization to work. Practically every medium of popular health education was utilized to secure public support and to bring the various official and voluntary agencies together for a concentrated attack on diphtheria.

* Read at a Joint Session of Child Hygiene, Public Health Education, and Public Health Nursing Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

The State Medical Society sent an announcement of the purposes of the campaign to every physician in the state; while the President and the Executive Officer personally visited local medical groups to stimulate and plan for their part in the program. Nearly every medical society in the state endorsed the project and some took an active part in local campaigns.

The work of all these agencies was directed and coördinated by an Executive Committee composed of representatives of all participating agencies. The committee held monthly meetings to formulate plans, direct organization and publicity, and to appraise results. With this pooling of the efforts of the parent organizations the diphtheria prevention campaign was started.

The result was the almost immediate awakening of local interest to the extent that the health departments and local health agencies of many up-state cities and towns immediately placed diphtheria prevention through immunization as one of their major activities.

As a logical development of the type of organization of the state-wide movement, local organizations followed somewhat the same plan with variations to fit local needs. In a community where the greater proportion of children is unprotected, the problem is to find the most effective way of securing the immediate immunization of a sufficient number to affect the incidence of diphtheria. The campaign method has proved its value in this respect; what will come later to secure continuous immunization is another question.

PLAN OF CAMPAIGN

The type of local campaign which has found most favor, judging by the frequency of its use, is the short intensive drive which aims to place diphtheria prevention in the center of the stage for a brief period terminating in large immunization clinics. The local health officer is responsible for the work. He secures the active aid of representative people; representatives of agencies, official, semi-official, and private, of the press, church and school, all of whom give actual help and lend prestige to the work. Sub-committees are formed each with a definite job. Thus the work of publicity, education, house-to-house canvass, finance, transportation and clinic assistance is taken care of.

The territory is divided into districts for ease in handling, but the work is carried out simultaneously in each district following the plans mapped out by the central committee. Besides the usual kind of publicity, all types of spectacular publicity stunts are used to create a public consciousness regarding the situation in such a way as to stimulate immediate action from the parents of children. House-to-

house visits are made by informed workers; usually volunteer lay people with the help of public health nurses, who interpret the subject to the parents and endeavor to secure a signed request card which is a promise that the children of the family will be taken for immunization either to the family physician or to the clinic. Subsequent follow-up of delinquents is carried on.

The campaign is terminated by the holding of large clinics at which all children who bear consents from their parents are immunized. The clinics are continued usually 5 or 6 weeks to take care of those who failed to appear but who may be brought in through the follow-up by public health nurses. This follow-up is of utmost importance and upon its thoroughness will depend to a large extent the success of the work.

RESULTS

The results that have been obtained from such campaigns can be judged by a brief statement of the accomplishment in some of the communities where a campaign has been conducted with an energetic follow-up program. Middletown has succeeded in immunizing about all its school children, and in 1929 reported protection in more than 70 per cent of those under the age of 5; Ogdensburg over 60 per cent; and Mamaroneck over 50 per cent of this lowest age group, in addition to a protected school population. Utica started a community campaign in February, 1927, and by July reported that the number of immunized children had increased from 38 to 68 per cent of the 5–9 age group and from 9 to 29 per cent of the under 5 age group. In the city of Niagara Falls an intensive campaign was started in March, 1928, and by the end of May the reports showed an increase of immunized children of the age group 5–10 from 67, which was the 1927 figure, to 95 per cent, and in the lowest age group from 8 to 43 per cent.

These figures serve to prove that this type of intensive campaign does produce the results desired in initiating a diphtheria prevention program, and if well directed will secure the immunization of a sufficient number of children both of the school and preschool group to reduce the morbidity and mortality from diphtheria in a given community.

THE PART OF THE PUBLIC HEALTH NURSE

The public health nurse has taken her part to help obtain these results. She usually becomes one of the official assistants of the health officer, who helps to interpret the plans to coworkers without

the health department. She does her share in instructing lay workers, receiving their reports, smoothing out difficulties, giving advice; and she follows up the parents who have been reported uncoöperative by the lay home visitors. She is usually responsible for the physical arrangement of the clinic rooms, for the details of clinic preparation, for assigning untrained helpers to the work they seem best fitted to do. The work she does during the campaign, however, is only incidental to her greatest contribution, which will be mentioned later.

CAMPAIGN EXPERIENCES

The early experiences of several communities where the first intensive campaigns were conducted demonstrated 3 important facts:

1. It was unnecessary to have a diphtheria epidemic to awaken public interest.
2. This interest could be a substantial one consisting of willingness to canvass, to lend and drive automobiles, and to perform clerical and other services in assisting at clinics.
3. A brief campaign of preparation was equally if not more effective than a long one.

These facts are important enough to bear discussion. The first one answers a controversial question. Many experienced public health workers have felt that the interest of the public cannot be awakened to the point of individual action unless the point in question has "struck home." This is true to a certain extent as is demonstrated by the fact that many more immunizations are secured when home visits are made to interpret to the parents the personal application of the problem which has been called to their attention through the channels of publicity. However, the evidence is that a striking individual or community situation need not be the basis for successful appeal; it can be made on the ground that it offers a necessary health measure to safeguard the children of a community. This point may be more pertinent to the situation in up-state New York because the first city-wide immunization campaign, which was a demonstration, was carried out in Auburn where diphtheria mortality and morbidity rates were high. The splendid success of the work in Auburn was thought by many to be due to the fact that diphtheria presented a community problem out of which capital was made in securing effective immunization. Numerous experiences have proved conclusively that such a local situation is unnecessary.

The second point is history repeating itself. We have many examples of concerted action for a worthwhile cause where all hands pull together under direction to accomplish a definite purpose. An experienced leader, a well thought out plan, careful definite instructions to workers, and a time limit, are the requisites necessary.

The third point is a good one to remember where volunteer workers aid in carrying out a big project. Their time will be generously given for short periods but cannot be drawn on indefinitely. The thrill of speedy returns to which all humans respond provides the driving power to keep volunteer help on the job. Much can be said in favor of steady dogtrotting methods, but whatever their merits, they have no place in the plan of work we have been discussing.

Another type of campaign was carried out in the city of Schenectady, initiated and sponsored by the County Medical Society. A physician was employed on part-time to supervise the work, and the services of a clerk provided. The plan was to interest the medical profession of the city and to hold the profession responsible for the immunization of the preschool population. The hope was that the physicians would make immunization a part of their routine practice to such an extent that continuous immunization would be carried out. Indigent parents, who are said to represent a very small percentage of the people of that community, were to take their children to public clinics. It was thought that immunization clinics were unnecessary except for indigents and that most people would prefer to go to their family physicians and pay for their services. The city was divided into districts and the Health Department gave its nursing service to make a house-to-house canvass. The nurses were to return card reports of consents, on which was to appear the name of the family physician. Any person claiming to be unable to pay was offered the alternative, on certification of the nurse, of going to his family physician gratis or going to a free clinic to be held later. Publicity was carried on through the usual channels. This method of campaign was continued for nearly 3 years and ended January 1, 1929.

The results were not all that the Medical Society had hoped. While it succeeded in securing about twice as many immunizations of children under 5 as of children 5–9 years old, the total of immunizations was too small to insure a community protection against a considerable increase or an epidemic of diphtheria. Whenever the nurses, for one reason or another, ceased to canvass, there followed a decline in the number of reported immunizations, indicating that the physicians of themselves apparently had not been securing a large number of immunizations. The cost of bringing a child to the family physician or to a clinic for immunization was $2, exclusive of the salary and expense costs of the nurses engaged in carrying on the canvass. This was also exclusive of the physician's fee. In no other community was such a cost even approached.

The campaign failed also to develop a community immunization

consciousness or to secure the participation of unofficial organizations. As a consequence the local health department at the end of the campaign faced the same situation which other communities faced at the beginning of 1926, and has made little recent progress.

Another plan attempted in a small community is interesting. A county public health nurse, with the advice and approval of the health officer, called up the physicians of the community and offered to visit the families of their patients where there were children, to explain to them the need for diphtheria immunization and to urge them to go to their family physicians on a certain day which they would designate. She offered her assistance to them for this "office (pay) clinic." Supplies could be secured in advance and the "fussing for one child" process would be eliminated. For some reason the physicians hesitated to accept such help even though they thought the scheme would work; so it fell through without a trial. Such a plan might hold possibilities for further experiment and might be very successful for small communities if sponsored by good community organization.

Other experiences could be mentioned but they would be to a large extent variations of the plans above outlined. The test of any campaign is whether or not it results in a number of immunized children of both the school and preschool age groups sufficient to eradicate diphtheria from the community. The importance of protecting the preschool age group cannot be too strongly emphasized. Many communities in the early days of the campaign followed the line of least resistance and thereby immunized a very small percentage of the preschool group. A study of their records for diphtheria morbidity and mortality proves without doubt that a community will only be protected from diphtheria when 25 to 30 per cent or more of the lowest age group is immunized, perhaps in addition to the school population.

There are many factors to consider in planning a campaign which will reach the objective with the least waste of time, energy and money. The magnitude of the problem should be judged by determining how many unprotected children there are in the community. The method of approach should be determined by the character of the community, the financial status of the people, the average intelligence, the racial make-up of the population, the influence of church and other organizations, and other factors peculiar to a community which will suggest themselves to one familiar with a local situation. Thought should be given to the right of the medical profession and of other organizations—official, semi-official and private—to participate in a community undertaking of such vital importance.

After 5 years of experience in our state it is possible to outline

with some degree of assurance the steps for a successful community campaign of diphtheria prevention through immunization.

The plan should provide for:

1. Concerted community action through utilization of the prestige and help of medical profession, of official, semi-official and private organizations, of representative lay people, of church, schools and of press
2. Adequate publicity to awaken community consciousness to the problem
3. A preliminary house-to-house canvass and subsequent follow-up of those who failed to respond
4. Adequate clinic service
5. Careful record keeping and appraisal of results
6. A follow-up program to secure continuous immunization of infants at 6 months of age

The above plan is not offered as the best one by any means but, given good leadership to adapt it to a local situation, it has proved its possibilities for success in initiating a diphtheria prevention program in a community. After public opinion has been created and after the first big job of immunization is over will come the part of the task that will insure continuous protection to the child population. It is for this task the public health nurse will make her greatest contribution. This is rendered day in and day out through her ability to reach the parents in the community, and to interpret to the parents the reasons for immunization in language they will understand. She may be aided by occasional intensive campaigns and by constant publicity; but in the long run as long as she holds her place as the most effective home visitor in the public health field, health authorities will depend on her skill in persuasion, on her effective teaching to secure continuous immunization of each year's crop of babies. A community cannot hope to safeguard its children from diphtheria permanently unless it expects such service from its public health nurses and sees to it that the results are obtained.

One health officer in a town where the average number of births is 300 a year has told the public health nurse he expects her to secure an average of 30 children for immunization each month. The campaigning is over and the work must go on. In fulfilling that requirement the public health nurse is taking her part in insuring her community against diphtheria.

EDITORIAL SECTION

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POSTVACCINAL ENCEPHALITIS

SINCE the days of Sir Edward Jenner, vaccination against smallpox has held its own as one of the greatest preventive measures ever discovered. It has been attacked on various grounds, religious and otherwise, but the world has accepted and practised it to the great benefit of mankind, and the saving of human life.

The mistake of holding that a single vaccination protects throughout life has been generally made. Waterhouse, 1799, said: ". . . A person who has undergone the local disease and specific fever occasioned by the cow-pox infection is thereby rendered ever after insusceptible of the small-pox." We have pointed out this fallacy in these columns and urged vaccination and revaccination, statistics in armies and other bodies where control is complete showing the value of this procedure as against the single inoculation.

A new factor has recently appeared. We were startled a few years ago by the appearance of encephalitis following vaccination. In Holland the cases were comparatively numerous, but at worst, they were small in number compared to the total number of vaccinations, though they led to a temporary suspension of vaccination. Cases were reported from England, and a few from other European countries. Our Public Health Service has been awake to the situation from the beginning, has made extensive studies, and kept close watch on developments. Altogether, some 57 cases of encephalitis have occurred in

America during the last ten years. In the light of the facts now known, what should the responsible physician recommend?

Ordinarily there is not the slightest ground for the omission of vaccination against smallpox. Exceptionally, it may be prudent to postpone it. Even if the number of bad results of which we are aware is smaller than the actual truth, still the procedure does vastly more good to society than harm. We have become so accustomed to the mild types of smallpox that many have grown careless. Sanitarians and physicians have warned people that the neglect of vaccination would be followed sooner or later by a return to the old virulent type in which the mortality was close to 50 per cent. This prediction has been verified in Kansas City, Detroit, Minneapolis, and Denver fairly recently. An analysis of the results of vaccination in many of these epidemics will convince all reasonable people that the disease was tremendously fatal in the unvaccinated, very slightly so in those once vaccinated, while the revaccinated were practically free from danger. Further, the epidemics were arrested in comparatively short order by vaccination. Within the memory of many living people the terrible experience of Montreal stands out against these favorable results.

So far from being afraid of vaccination we should urge it more than ever before, and recommend especially vaccination during the early months of life, before teething, since untoward results at this early age are exceptional. Revaccination should follow at proper intervals, especially in early life, and at school age, since smallpox is a disease of that period.

No human procedure is infallible. Health officers and physicians should arm themselves with the facts as to the occurrence of smallpox before the introduction of vaccination, and at the present time. We should acknowledge the very slight risk which attends the procedure. We can no longer tell people that it is entirely devoid of danger, but we can assure them that the beneficial results to the community far outweigh the danger. Further, there is some reason to believe that encephalitis following vaccination may be connected with the greater prevalence of epidemic encephalitis and poliomyelitis observed in several countries, and that with their decrease, postvaccinal encephalitis will also diminish.

After more than a century of experience under all conditions, we can unhesitatingly endorse the findings of the College of Physicians of London: ". . . that the public may reasonably look forward with some degree of hope to the time when all opposition shall cease, and the general concurrence of mankind shall at length be able to put an end to the ravages at least, if not to the existence, of small-pox," and the Re-

port of the National Vaccine Establishment: "The Board have infinite satisfaction in stating the two following important and decisive facts in proof of the efficacy and safety of vaccination, viz., that in the cases which have come to their knowledge, the small-pox after vaccination, with a very few exceptions, has been a mild disease; and that, out of the many hundred thousand persons vaccinated, not a single well-authenticated instance has been communicated to them, of the occurrence of a fatal small-pox after vaccination."

STANDARD METHODS OF COST ACCOUNTING FOR PUBLIC CLEANSING WORK

THE cost of street cleaning and collecting and disposing of garbage, ashes and other solid municipal wastes is now largely a matter of conjecture, so far, at least, as American cities are concerned. Nobody knows how much a city ought to pay for this service per capita or how much it does pay. Few, if any, keep records which attempt to cover the whole cost, including the work done by private scavengers, much less are able to report correctly on the cost of machine sweeping or of hauling or disposing of the wastes produced.

An attempt to standardize cost keeping in street cleaning and refuse collecting and disposition in American cities is being made through the Committee on Uniform Street Sanitation Records. This committee represents primarily the International Association of Public Works Officials, formerly called the International Association of Street Sanitation Officials. Other organizations represented in an advisory capacity include the National Committee on Municipal Standards, the International City Managers' Association, the American Society of Municipal Engineers, the Governmental Research Association, the American Society of Civil Engineers, the American Municipal Association, the American Road Builders' Association, the National Municipal League, and the American Public Health Association. The work is financed and staffed by the International City Managers' Association, through funds supplied by the University of Chicago and the Julius Rosenwald Fund.

The committee has issued what it calls a preliminary report and is now engaged in promoting a scheme of cost accounting based on certain standard work units which it proposes shall be universally employed in American cities. One of these units is called the "street cleaning mile." The theory is that distance rather than area is the important thing to record, the idea being that "the work is all applied in a lineal direction." The general custom up to now has been to consider the number of square yards cleaned as giving the best indication

of the work done. Again, the committee considers the cubic yard as the best unit of measure of refuse. At present custom is divided between the cubic yard and the ton. In the one case the quantity is usually estimated, in the second it is weighed.

The scope of the committee's work includes the results of all methods of sweeping and cleaning the pavements; catch basin cleaning; snow clearing and removal; garbage, ashes and refuse removal; removal of dead animals and night soil; and the ultimate disposal of the wastes collected. It does not describe how any of this work should be done. It does not include sewerage construction or maintenance, or sewage disposal, although this subject has much to do with street sanitation because of the part played by sewers in carrying off storm water and washings from the streets. The kind of pavement and its state of repair are not apparently allowed for although these have much to do with the sanitary condition of streets and the cost of cleaning them.

It is worth noting that the standards proposed do not take into account the dirtiness of the streets to be cleaned nor the degree of cleanness achieved. These would seem to be essentials, without which any records of efforts expended can have but little value.

"Installations" of systems of record keeping have been begun by the committee and the promotion of the ideas put out in the "preliminary report" is being actively pushed. In a recent press release the first complete installation of the records and cost accounting proposals of the committee is reported as made at Brunswick, Ga. A complete description of what has been begun there, with all the forms employed, is to be distributed to 800 other cities in this country. The committee explains: "This honor was accorded to Brunswick because it is performing all types of activities" included in the committee's program.

The idea of trying to put public cleansing on a businesslike basis, at least so far as reporting what is done goes, is worthy of all praise, and it is to be hoped that the committee has found a good way to make a start at it. It is a long step from the present state of the matter to the state of accountability aimed at by the committee and one cannot help wondering how many of the practical men in charge of this kind of work will willingly accept the forms and other proposals of the committee. How helpful such records can be in presenting a picture of what is done is not entirely clear.

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MONTREAL AND ITS PAST

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IN this new world of America, there are not more than three or four cities which can boast of three centuries of existence. Montreal is quickly nearing that goal, having been founded in 1642. On that account, it is probably not out of season to cast on its past at least a rapid look.

Montreal was actually started in 1642, but if we are to measure the complete span of its history, we must go back to 1535 when the land on which it now proudly rises was trodden by the first white man, none other than Jacques Cartier himself, the discoverer of Canada. Undoubtedly, the famous navigator, while he was sitting among the Indians on the slope of Mount Royal, never dreamed that the round shaped village of Hochelaga would some day be changed into the immense agglomeration of structures we are now witnessing, but he nevertheless marked for civilization the very spot on which he stood. The birth of the Canadian metropolis may be truly said to date from his landing at Hochelaga.

A little more than a hundred years, however, were to elapse between Cartier's first claim of Hochelaga as a new domain of the King of France and the actual planting of a city on the chosen land. During the interval, time has wrought many changes. In 1615, when Champlain, the second of his race, visited the site of Hochelaga, the Indians who greeted Cartier had already been driven toward some other country, probably by the misfortunes of war, and no trace even was left of their once prosperous village. The island had become a wilderness through which occasionally roamed migratory hordes of savage hunters. For some time again the only

white men who passed its shores were a few missionaries and hardy voyageurs headed toward the great lakes. Everybody of course was struck by the wonderful situation of the place but, in the infancy of the colony and with only a handful of defenders, there could be no thought of venturing the establishment of a post on a spot so far advanced and so extremely dangerous. To undertake such a daring enterprise at the time required more than the ordinary nerve of courageous explorers—it required the mystical enthusiasm of men who sincerely believed they answered a call from above. It is indeed remarkable that the foundation of Montreal was entirely and solely commanded by religious zeal. There was also more than a tinge of mysticism in the adventure of the Pilgrims of Plymouth twenty-two years previously, but while the passengers of the Mayflower were actuated principally by a yearning for religious freedom, Maisonneuve and his followers thought only of the conquest of souls.

There is even a touch of supernatural flavor in the wonderful beginnings of the Canadian city. It is said that two pious gentlemen of France, who till then had never known each other, the priest Jean Jacques Olier and the layman Jerôme leRoyer de la Dauversière, had at the same moment a dream in which they saw clearly the configuration of the island of Montreal, although they had not known of it before, and heard an inner voice compelling them to establish a new colony for the furtherance of

Mount Royal is in the center of the city. It is a natural public park of 550 acres, 600 ft. above sea level. From this Look-Out on a clear day to the south may be seen the Adirondack Mountains, to the south-east the Green Mountains of Vermont, and to the east the Laurentian Range. At the base of the Look-Out may be seen the center of the city of Montreal, and the St. Lawrence River, also the harbor and the great canal system connecting upper lake transportation with the St. Lawrence River traffic.

1. Sturdy stone towers, built for defence against the Indians in Ville Marie's early days, standing in grounds of Montreal Seminary, Sherbrooke Street West. In one tower the pioneer nuns lived, in the other they taught the children of the settlement. 2. The wind mill and the outdoor oven are still used in Rural Quebec. 3. Chateau de Ramezay, erected in 1705, residence of the French and English governors of colonial Canada, and now a museum.

1. Panorama of Montreal showing Canadian National Victoria Bridge. 2. Royal Victoria Hospital is a monument to the generosity of Lord Strathcona, Lord Mount Stephen and J. K. L. Ross. 3. Montreal Harbor is owned and operated by the Canadian Government. It is a national port, and is managed by a special commission called the Montreal Harbor Board.

the glory of God. At all events, the two men providentially met in Paris and, after having by their joint efforts formed a society of no less ardent contributors, called "la Compagnie de Notre Dame de Montréal," succeeded in fulfilling their godly task. On May 18, 1642, the first settlers landed in Montreal, or, as it was then called, Ville-Marie. They were about 60 in number including half a dozen women. It was a very humble beginning for what was to become one of the large cities of the world.

The newcomers first busied themselves in building a roof which would shelter them from the rain and a palisaded fort which would defend them against the Indians lurking in the surrounding woods. The task before them was arduous, but they were fortunate in having as a leader a man whose bravery was equal to his righteousness, a man whose name is revered to this day, and has never been tainted with the smallest blemish—Paul de Chomedy, Sieur de Maisonneuve. When pressed by Governor Montmagny to desist from his rash enterprise, this true Chevalier proudly answered: "Even if every tree of the island were to be changed into a fighting Iroquois, I am bound to go thither and I will." His fortitude inspired his followers with the necessary courage to withstand the enormous difficulties and still more to face an unceasing danger. A small band far from any possible help, they were practically in the jaws of death, continually exposed to the cruel attacks of the ever menacing Indians.

For years, the colonists had to till their soil with one hand on the plow and the other carrying a musket. The losses were so great that, after ten years,

Bonsecours Market is located in one of the oldest sections of the city. It is opposite the City Hall and next to the Chateau de Ramezay, located near the harbor. On Tuesdays and Fridays, which are market days, the French-Canadian habitant brings his vegetables into Montreal to sell openly on this market. Visitors to Montreal find it a most interesting place to visit.

Old fort at Chambly, on the Richelieu River, 14 miles from Montreal. Built in 1710 on the site of an earlier fort, it has been fought for, taken and re-taken many times, being held in turn by French, British, United States and Canadian forces.

notwithstanding two or three arrivals of recruits, the white population of the island was still but 60. Another decade, and the infant colony very nearly came to its end when seven hundred Iroquois descended the Ottawa River determined on the complete and definitive massacre of the "pale faces." It was saved only by the heroic and almost superhuman sacrifice of Dollard des Ormeaux and his 17 companions, who went to meet the enemy at the Long-Sault and so bewildered them by a fight of several days that the survivors fled back to their country.

Even after the coming, in 1665, of the Carignan Regiment, which was ordered to New France in order to quell the Iroquois incursions, Montreal enjoyed only a relative peace. For years it bore the brunt of the attacks which occurred and remained literally the bulwark of the country. It was not until the end of the 17th century, after the massacre of Lachine, the last great disaster of the kind, that tranquillity was at last obtained and the city, with a population of about 1,000, began to prosper. Quebec, the capital, was still the chief town, but Montreal was slowly and surely gaining. On account of its privileged situation at the head of inland navigation, it had soon become the recognized center of the fur trade. Indians flocked from all sides to its shores with skins, and at the annual fair especially, the town was the scene of an extraordinary, but somewhat boisterous, activity. Montreal also provided the larger part of the famous "coureurs des bois," who ought to be pardoned for much of their lawlessness in view of the

enormous service they rendered civilization by their adventurous discoveries. Many of the great explorers who paved the way for the development of this continent have hailed from Montreal, LaSalle, Iberville, Lamothe Cadillac, Tonty, Dulhut, Bienville et Perrot.

Thus Montreal continued to thrive as a center of trade and enterprise until the end of the French regime. Its progress was for some time halted by a disastrous fire and still more by a considerable exodus which in a few years reduced the population from 8,300 to 5,700, but it soon resumed its former pace and even increased it. The incoming of the British element, which added to the wonderful qualities of endurance of the sturdy native race its own qualities of resourcefulness and enterprise, gave a new impetus to the life of the community, and at the end of the 18th century, Montreal had already taken the lead over the older city of Quebec, in population as well as in importance. Once more it had been in the throes of the war, in 1775, when, after a first abortive attempt by Ethan Allen, Montgomery finally entered it and raised over its walls the flag of the Independent Colonies. The ordeal, however, was of a short duration and in May, 1776, the city was restored to British rule, never to be disturbed again by invaders. Benjamin Franklin, who came to Montreal as an envoy of the Congress with Chase and Carroll, was not over happy in his mission, but he is none the less thankfully remembered for that most beneficent gift he left them, the printing press.

From that time, the history of Montreal may be summed up in these two words: progress and industry. Even the political wrangles which were rife in its midst for so long a period, even the War of 1812, which happily left it unruffled—thanks to the timely victory of Salaberry at Chateauguay—even the troublous times of 1837–1838 which so tragically ended with the death on the scaffold of nearly a score of patriots, could not impede its steady march toward greatness.

Everyone remembers the ringing words of Father Vimont, regarding the new settlement of Ville-Marie, as he stood by the side of Maisonneuve, that morning of May 18, 1842, when the little band of religious enthusiasts landed at the spot now occupied by the Customs House: "You are a grain of mustard seed that shall rise and grow till its branches overshadow the earth." There is no question today that the prophecy of the good Jesuit has been amply fulfilled. Montreal is today one of the outstanding cities, not only on this continent, but in the entire world. Covered by two great races as by two powerful streams which, like the Arethusa and the Adriatic sea of old, may not mingle their waters, but none the less flow together and peaceably toward the same ocean of progress, Montreal, with its population of over a million, possesses that peculiarity of being at the same time the second largest city in the British Empire and the second largest French city in the world. It already attracts universal attention by its ever increasing commercial power and by its constantly renewed spirit of enterprise. In the light of its past achievement, it is impossible to foretell where it will stop and we can only watch it grow.

ASSOCIATION NEWS

Western Branch A. P. H. A.

THE Second Annual Meeting of the Western Branch, American Public Health Association, was held at Seattle from May 28 to 30. The meeting was called to order by President Hassler at 10 o'clock on the morning of May 28 at the Hotel Olympic. Dr. Hassler delivered a masterly annual address, discussing with vigor a number of particularly live questions of public health interest.

The scientific meetings continued throughout the three days. Papers were of an exceptionally high grade and the program admirably balanced. Appreciation of the excellence of the material presented was shown by the fact that all sessions were fully attended and the audience remained to the end of the meetings, with very little of the usual interruption caused by individuals coming and going during the reading of papers.

The arrangements made by the Entertainment Committee, headed by Mrs. C. B. W. Raymond with Mrs. J. W. Hyneman as Vice-Chairman, had made provision for delightful sight-seeing and social events which added much to the complete success of the meeting.

Every credit is due Dr. William P. Shepard, Secretary of the Western Branch, for the completeness of the arrangements made by him in planning the meeting.

Dr. E. T. Hanley, Health Commissioner of Seattle, Wash., was elected President of the Western Branch for the coming year; the three Vice-Presidents elected are Dr. A. L. Beaghler of Denver, Colo., Dr. H. W. Hill of Vancouver, B. C., and Dr. Walter Brown of Stanford University, Calif.; Dr. William P. Shepard of San Francisco, Calif., was reëlected Secretary, with W. F. Higby of San Francisco as Treasurer.

The Annual Meeting next year will be held in Denver, Colo.

Things of Interest about the 60th Annual Meeting City—Montreal

In 1535 Jacques-Cartier, sailing up the mighty St. Lawrence, came upon a large fortified Indian village. This Indian village marks the site of a part of present-day Montreal.

Champlain in 1611 established in Montreal a trading post, and in 1642 Paul de Chomedy, Sieur de Maisonneuve, founded the city proper.

Montreal remained under French rule until 1763, when Canada became an English possession under the treaty of Paris.

Montreal has over 250 public schools, which are bilingual, i.e., teaching both French and English languages from the earliest grades.

About 75 per cent of the inhabitants of Montreal are of French origin, which with English, Canadian and American or other nationalities makes it so cosmopolitan in character and so interesting to tourists.

Mount Royal Park in the center of the city has beautiful drives along typical mountain roads to the summit, and

is about 600 feet from the sea level, consisting of approximately 550 acres. Automobiles are not permitted. From the summit a magnificent view is to be had of the city, the harbor and River St. Lawrence, and a distant outline of the Adirondack Mountains.

Montreal, the most important city in Canada, is a thousand miles from the sea, one of the greatest inland ports in the world, and is the national seaport of Canada.

At Montreal terminates the great canal system which brings the water traffic from the West as far as from the head of Lake Superior.

Montreal is the terminus and headquarters of the Canadian Pacific and Canadian National Railways, two of the largest railroads in the world (which are both Transcontinental Lines).

CUSTOMS REGULATIONS

1. The law requires that every person entering the United States shall make a declaration and entry of personal baggage. The senior member of a family present as passenger may, however, declare for the entire family.

(a) Returning residents of the United States must declare all articles acquired abroad, in their baggage or on their persons, whether by purchase, by gift, or otherwise, and whether dutiable or free of duty. Exemption, however, will be allowed by customs officers of articles aggregating not over $100 in value, if suitable for personal or household use, or as souvenirs or curios, and whether intended for the personal use of the passengers or as gifts or presents to others, provided the articles are not bought on commission for another person nor intended for sale. Articles so exempt from duties must, nevertheless, be declared.

(d) Passengers must not deduct $100 exemption in making out their declaration. Such deductions will be made by Customs Officers.

Each passenger over 18 years of age may bring in free of duty 50 cigars or 300 cigarettes, or smoking tobacco not exceeding three pounds if for the bona fide use of such passenger. These articles must be declared, but will be passed free by Customs Officers in addition to the $100 exemption.

(b) The offering of gratuities or bribes to Customs Officers is a violation of law.

6. All articles acquired abroad should be packed, whenever possible, in one receptacle. This will save trouble and inconvenience at time of examination.

(b) United States Customs Officers are located at Windsor and Bonaventure stations. Baggage not examined at these points will be forwarded to destination, if such is a bond port, for examination. If destination is not a bond port, inspection will be made at the frontier.

MEXICAN ANNOUNCEMENT OF A. P. H. A. MEETING

In an editorial in the March issue of *Ingenieria* (*Publicacion Mensual Organo de la Facultad Nacional de Ingenieros, Mexico*), the value of meetings such as that of the A. P. H. A. in Montreal is stressed. In particular attention is called to the value of coöperation between the physician and engineer:

> The doctor studies, with the aid of his knowledge of diseases, the physiological effects of the many factors which exist in a modern city. He then gives his decision and the remedy. . . . It is not in his power to prevent the cause when it is due to the physical medium in which we live. The engineer completes the task of the doctor. . . . With the aid of his knowledge he designs well conditioned and safe projects in accord with the recommendations afforded by medical science and thus destroys the root of such evil conditions. . . .
>
> Medicine and engineering are the two professions which extend the protecting wings over disease stricken humanity. Their mutual help, their open coöperation, will give us a means for effective welfare. . . .

The American Public Health Association contributes to the realization of this end. It works in order to obtain the scientific ideals which guarantee healthful living conditions. We are proud to place on the first page of this issue the announcement of its future meeting and send our cordial greetings for the success which we are sure it will obtain.

APPLICANTS FOR FELLOWSHIP

LABORATORY SECTION: John W. M. Bunker, Ph.D., Cambridge, Mass.; Lawrence T. Clark, Detroit, Mich.; Henry G. Dunham, Detroit, Mich.; Leon C. Havens, M.D., Montgomery, Ala.; Theodore W. Kemmerer, M.D., Jackson, Miss.; Pearl Kendrick, Grand Rapids, Mich.

PUBLIC HEALTH ENGINEERING SECTION: Aime Cousineau, C.E., Montreal, Que.; Warren J. Scott, Hartford, Conn.; Ellis S. Tisdale, Charleston, W. Va.

PUBLIC HEALTH EDUCATION SECTION: William H. Eaton, M.D., Santa Barbara, Calif.; Clair Van N. Langton, D.P.H., Corvallis, Ore.; Jessie I. Lummis, Denver, Colo.; Richard G. Soutar, Jr., M.D., Sacramento, Calif.

PUBLIC HEALTH NURSING SECTION: Mary A. Brownell, R.N., New York, N. Y.; Mary C. Dickerman, R.N., New York, N. Y.; Anna Heisler, R.N., St. Louis, Mo.; Bertha O. Yenicek, R.N., St. Louis, Mo.

UNAFFILIATED: Harry E. Foster, M.D., Berkeley, Calif.; Wilfred H. Kellogg, M.D., Berkeley, Calif.; Ida M. Stevens, Berkeley, Calif.

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A. P. H. A. by the Sub-committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

Health Officers Section

Gregoire F. Amyot, M.D., D.P.H., N. Vancouver, B. C., Director of Health Unit

Margaret M. Bullard, M.D., King City, Calif., Deputy County Health Officer

Wheeler Davis, M.D., Kennett, Mo., County Health Officer

R. M. Fortier, M.D., Salinas, Calif., Health Officer, Monterey County

William G. C. Hill, M.D., Moundsville, W. Va., Marshall County Health Director

Gustave Lacasse, Tecumseh, Ont., President, Ontario Medical Health Officers Assn.

Francis M. A. McNaughton, M.D., Westmount, P. Que., Health Officer

Roscoe L. Mitchell, M.D., Lewiston, Me., District Health Officer

R. L. Wright, M.D., Poteau, Okla., County Supt. of Health

Laboratory Section

Eudore Giguere, B.A.Sc., Montreal, P. Que., Chief Chemist, Dept. of Health

Louis-Philippe Lebeau, M.D., Montreal, P. Que., Bacteriologist, Provincial Bur. of Health

Vital Statistics Section

Reuben Kaznelson, Ph.D., B.S., Jerusalem, Palestine, Asst. Director, Hadassah General Organization (Assoc.)

Public Health Engineering Section

Herbert M. Bosch, B.S., Jefferson City, Mo., Asst. Public Health Engineer, State Board of Health

Jorge V. Davila, B.S., M.S., Santurce, P. R., Engineer charge of water and sewage purification, Dept. of Health

E. X. Jones, New York, N. Y. (Assoc.)

John L. Oberly, B.S., Chicago, Ill., Ventilation Engineer in charge, City Health Dept.

Frank W. Stock, Stamford, Conn., Nustone Products Corp.

Industrial Hygiene Section

John W. Dugger, M.D., Jackson, Miss., Director, Bur. of Industrial Hygiene

Austin D. Reiley, New York, N. Y., Supervisor of Risks, Mutual Life Ins. Co.

Food, Drugs & Nutrition Section

Jean V. Knapp, D.V.M., Tallahassee, Fla., State Veterinarian

Lillias D. Lund, B.S., Fort Wingate, New Mex., Teacher of Home Economics, U. S. Dept. of Interior, Office of Indian Affairs

Public Health Education Section

Joseph A. Baudouin, M.D., Montreal, P. Que., Professor of Hygiene and Public Health, Univ. of Montreal

Mary E. Elliott, Cambridge, Mass., temporarily student at Simmons College, connected with Walla Walla Health Center
Abraham J. Levy, Ph.D., M.D., New Haven, Conn., Fellow of Hadassah (Assoc.)
Louise E. Northup, B.S., Harrisburg, Pa., Director, Health Education Service, Penn Milk Products Co.

Public Health Nursing Section

Lillian Goodall, Ann Arbor, Mich., Student (Assoc.)
Edna J. Keller, R.N., Dyersburg, Tenn., Dyer County Health Nurse
Edith Ross, R.N., Van Buren, Mo., Chief Nurse, District Health Dept.
Mrs. Bertha Stevens, R.N., Springfield, Mo., County Public Health Nurse
Olive M. Whitlock, R.N., Rockport, Mo., County Public Health Nurse
Dorothy I. Willis, R.N., Boonville, Mo., County Public Health Nurse

Epidemiology Section

Benjamin G. Horning, W. Hartford, Conn., Epidemiologist
Horace G. MacKerrow, M.D., Worcester, Mass., Tuberculosis Sanitarium
Elzear Pelletier, M.D., Montreal, P. Que., Consulting Hygienist, Provincial Bur. of Health

Unaffiliated

John W. Armstrong, M.D., Berea, Ky., College Physician, Berea College

MONTREAL HOTEL RATES

		Single Room		Double Room	
Hotel	*Room Capacity*	*Without Bath*	*With Bath*	*Without Bath*	*With Bath*
de la Salle	150	....	$3 00–$5.00	....	$4.00–$6.00
Ford	750	$1.50–$2.25	$2.50	$3.00–$4.50	$5.00–$6.00
Mount Royal	1,100	....	$4.00	....	$7.00
Place Viger	125	$3.00	$4.00	$5.00	$7.00
Queen's	500	$3.00–$3.50	$4.00–$5.00	$6.00	$7.00–$10.00
Ritz-Carlton	250	....	$6.00	....	$10.00–$12.00
Windsor	750	....	$4.50	....	$8.00

.....(*Cut off on this line and mail to the hotel of your choice.*).....

HOTEL RESERVATION BLANK FOR MONTREAL MEETING

AMERICAN PUBLIC HEALTH ASSOCIATION

SEPTEMBER 14–17, 1931.

To.....
(Name of Hotel)

Please reserve for me.....rooms for.....persons for the A. P. H. A. Meeting. (Cross [X] is placed after my preference.)

Single room.....Double room.....

Maximum rate per day for room $.....Minimum rate per day for room $.....

I expect to arrive..... If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name.....

Street Address.....

City..... State.....

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Kansas City's Health—The Chamber of Commerce of Kansas City has sponsored a survey of the health and hospital situation, the study being reported in 3 major divisions: (1) the public health services of the voluntary and tax supported agencies, (2) community aspects of hospital facilities, (3) the administration of the city hospital group.

The application of the *Appraisal Form* of the American Public Health Association indicates that the health services are somewhat less than 70 per cent of the standard. This deficiency is ascribed to the lack of stability and leadership existing in the official health department in the past. There is need of the establishment of a nonpartisan health department. There is now being expended $1.39 per capita from official and unofficial sources. The leadership in Kansas City has come from the voluntary groups working so far as possible with the official agencies concerned.

There are three groups providing public health nursing service in Kansas City. The Health Department has but 5 nurses while the Board of Education employs 52, and the Visiting Nurse Association 55. Many of the functions of the latter are unquestioned responsibilities of the Health Department, such as the tuberculosis and child welfare services. Complete generalization of nursing service is recommended for consideration in order to secure economy of operation.

Less than one-half of the milk supply is safeguarded by pasteurization. Health education has been carried on by the Health Conservation Association through affiliated and coöperative agencies and the Children's Bureau.—Health and Hospital Survey of Kansas City, Mo., Kansas City Chamber of Commerce, 1931.

County Health Program—There are at least four factors to be considered in a well balanced rural health program: first, the local problems should be well defined; second, available resources must be made to fit in with local problems; third, the *Appraisal Form* should be used to assist in distributing local effort to meet the various needs of a well rounded health program; fourth, a planned work program will aid in carrying out the proposed program.—F. L. Roberts, *Pub. Health Rep.*, 46, 1079 (May 8), 1931.

Tuberculosis Control in New York State—There were reported in upstate New York in 1930, 7,904 new cases of tuberculosis and 3,844 deaths from this disease. Of 7,216 pulmonary cases reported, 20 per cent were in the minimal stage, 25 per cent moderately advanced, and 33 per cent advanced. There is need of a greater appreciation of the value of diagnostic laboratory service as indicated by the fact that 57 per cent of the cases contained no information regarding examination of sputum.

The State Health Department maintains an itinerant chest clinic at which 5,588 patients were examined, 63 per cent of whom were new cases. Fifty thousand patients were examined during the year at 63 local clinics.—*Health*

News, New York State Dept. of Health, 8, 78 (May 18), 1931.

Whooping Cough in Maryland—During the period 1921–1929 inclusive, there were reported in Maryland 34,238 cases and 1,484 deaths from whooping cough. Baltimore reported 25,062 of these cases. Case reporting is less complete in the rural sections where 56 per cent of the deaths occurred and only 27 per cent of the cases was reported. The loss of time due to illness from whooping cough is not generally appreciated. As the Maryland quarantine period is 30 days, during the period of the study there were 1,027,140 sick days or an average of 3,804 months lost during each year. There has been a slight downward trend in the death rate from whooping cough. The mean rate for the period 1906–1914 was 16.4 per 100,000 population, while the mean rate for the last 9 years was 10.7.—John Collinson, Whooping Cough in Maryland, *Bull.*, Maryland State Dept. of Health, 1931.

Cleveland Census Tracts—A book has been prepared to present basic population data for Cleveland and to carry a street index which makes possible a geographical distribution of all sorts of statistical units. Such a volume is of great help to all who need population facts, especially dealing with problems of public and private health and for the improvement of social and living conditions.—Howard W. Green, *Population by Census Tracts, Cleveland and Vicinity*, Cleveland Health Council, 1931.

LABORATORY

JOHN F. NORTON, PH. D.

PROPOSED CHANGES IN STANDARD METHODS OF WATER ANALYSIS

AT the meeting of the Committee on Standard Methods of the Laboratory Section of the American Public Health Association at Fort Worth, October 29, 1930, certain changes in methods were recommended in addition to those previously recommended and published in the *Journal* for January, 1930. These changes were approved by the referees involved, and are presented here in order that the members of the Association may have full information and opportunity to comment if they so desire. This report contains the complete description of proposed Standard Methods for the determination of turbidity of soap hardness to replace those in use at present; a summary of methods for the rapid analysis of water to be used for boiler purposes, these methods being new material as far as "Standard Methods" is concerned but representing what is believed to be the best current practice; and a proposed bacterial method using brilliant green lactose bile medium. Other less important and to a large extent editorial changes will be indicated.

Atomic weights have been brought up to date and necessary corrections made in chemical factors.

The following method is recommended

for the measurement of turbidity: The removal of suspended matter by centrifugating before determination of color is recommended for turbid waters.

The turbidity of water is due to suspended matter, such as clay, silt, finely divided organic matter, microscopic organisms, and similar material.

I. TURBIDITY MEASUREMENTS

Turbidity measurements are based on the depth of solution required for the image of the flame of a standard candle to disappear when observed through the solution. The standard instrument for making such measurements shall be the Jackson candle turbidimeter, which consists of a graduated glass tube, a standard candle, and a support for the candle and tube. The glass tube and the candle shall be supported in a vertical position so that the center line of the tube passes through the center line of the candle, the top of the support for the candle being 7.6 cm. (3 inches) below the bottom of the tube. The glass tube shall be graduated, preferably to read direct in turbidities, and shall have a flat polished bottom. Most of the tube should be enclosed in a metal or other suitable case when observations are being made. The candle support shall have a spring or other device so as to keep the top of the candle pressed against the top of the support. The candle shall be made of beeswax and spermaceti gauged to burn within the limits of 114 to 126 gr. per hour.

To insure uniform results it is desirable that the flame be kept as near constant size and a constant distance below the glass tube as is possible. This will require frequent trimming of the charred portion of the candle string and frequent observations to see that the candle is pushed to the top of its support. Each time before lighting the candle remove such portion of the charred part of the string as is very easily broken off with the fingers. Do not keep the candle lighted for more than a few minutes at a time, for the flame has a tendency to increase in size.

The observation is made by pouring the solution into the glass tube until the image of the candle flame just disappears from view. Pour slowly when the candle becomes only faintly visible. After the image has disappeared the removal of 1 per cent of the solution from the tube should make it again visible. Care should be taken to keep the glass tube clean on both the inside and the outside. The accumulation of soot or moisture on the lower side of the glass bottom of the tube may interfere with the accuracy of the results.

The figures in Table I give the turbidities for the depth at which the image of the candle just disappears.

TABLE I

GRADUATION OF CANDLE TURBIDIMETER

Depth of Liquid (cm.)	Turbidity	Depth of Liquid (cm.)	Turbidity
2.3	1,000	10.3	200
2.6	900	10.8	210
2.9	800		
3.2	700	11.4	190
3.5	650	12.0	180
		12.7	170
3.8	600	13.5	160
4.1	550	14.4	150
4.5	500		
4.9	450	15.4	140
5.5	400	16.6	130
		18.0	120
5.6	390	19.6	110
5.8	380	21.5	100
5.9	370		
6.1	360	22.6	95
6.3	350	23.8	90
		25.1	85
6.4	340	26.5	80
6.6	330	28.1	75
6.8	320		
7.0	310	29.8	70
7.3	300	31.8	65
		34.1	60
7.5	290	36.7	55
7.8	280	39.8	50
8.1	270		
8.4	260	43.5	45
8.7	250	48.1	40
		54.0	35
9.1	240	61.8	30
9.5	230	72.9	25
9.9	220		

Observations should be made in a darkened room or with a black cloth over the head. It is allowable to substitute for the standard candle other forms of light, but the instrument must be calibrated to give turbidity readings that correspond with the standard candle.

II. TURBIDITY MEASUREMENTS BELOW 25

It is evident that the candle turbidimeter cannot be used for the direct measurement of low turbidities. When the turbidity is below 25 it is better to make the determinations by comparing with standards of known turbidity. For turbidities between 5 and 25, approximate results may be obtained by comparing in bottles with standards of known turbidity. Below 5, it is better to use some kind of an

instrument especially designed for low turbidity comparisons such as the Baylis turbidimeter.[1]

Preparation of Standards—Add 2 or 3 gm. of fuller's earth to about 1 liter of distilled water, thoroughly agitate several times within a period of 1 hour, and then allow to stand about 24 hours. Withdraw part of the supernatant liquid without disturbing the sediment on the bottom, and test the turbidity with the Jackson candle turbidimeter. If the turbidity is less than 25, add more earth, allow to stand an additional 24 hours, and repeat the testing until a turbidity of at least 25 is obtained. It is better to use an amount of the earth that will give a turbidity less than 50. This constitutes the stock solution, which will remain in fairly good condition for several months. Before using the stock solution for making turbidity standards thoroughly agitate and make a turbidity measurement with the candle turbidimeter. The turbidity may change slightly on standing.

Dilute portions of the stock solution to the desired standards with zero-turbidity distilled water. For turbidity readings between 5 and 25, standards of 5, 10, 15, 20, and 25 may be prepared. Turbidities between zero and 2.0 may be measured by comparing the standards in the Baylis turbidimeter. To cover this range, standards of 0.1, 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 1.8, and 2.0 should be prepared. The quantity of stock solution required to prepare a certain standard is the volume of the standard multiplied by the desired turbidity and this divided by the turbidity of the stock solution. If the stock solution has a turbidity of 30 and it is desired to prepare 500 c.c. of 0.6 turbidity, (500 × 0.6) divided by 30 gives 10 c.c. of the stock solution.

Procedure—When the turbidity is between 5 and 25 approximate determinations may be made by comparing the samples in bottles with standards of known turbidity. This should be done in clear glass bottles, preferably of 1 liter capacity or greater. The comparison shall be made by viewing both sample and standard sidewise, looking at some object and noting the distinctness with which the margins of the object can be seen. The standards shall be kept stoppered, and both standard and sample shall be thoroughly shaken before making the comparison. The standards should be made fresh at least every month. In order to prevent any bacterial or algal growths from developing a small amount of mercuric chloride may be added to the standards.

For making turbidity measurements between 0.0 and 2.0 with the Baylis turbidimeter, fill one of the long glass tubes with the water to be tested. Allow to stand until all air bubbles rise to the surface, which is usually between 5 and 10 minutes. Observe the sample before filling the other tube with a standard of known turbidity and make a guess at the turbidity. Use the standard nearest the guess, and when the air bubbles have disappeared from the standard, which is usually between 1 and 2 minutes, make a comparison. If the sample varies from the standard, use another standard and continue until the one nearest that of the sample is found. Standards standing in the glass tube more than 2 or 3 hours should be thoroughly agitated before making a comparison. Keep the glass tubes filled with water above the line where the light strikes the tube; otherwise corrosion of the glass at the water line may interfere with the results. The glass tubes should be kept clean on both the inside and outside. Do not handle the tubes below the line where the light strikes them.

Turbidities between 2.0 and 5.0 shall be made by diluting the sample with zero-turbidity distilled water to a turbidity less than 2.0 and comparing in the Baylis turbidimeter, or the test shall be made by the use of some instrument designed for turbidity comparisons that will give accurate results.

Turbidities between 5 and 25 also may be diluted below 2.0 for comparison in the Baylis turbidimeter, unless a more accurate method than comparison in bottles is available. Direct observation in color comparison tubes gives fairly good results when the color is less than 10.

The results of turbidity observations shall be expressed in numbers which correspond to units of turbidity as follows:

Turbidities	0.0	and	5.0	recorded	to	the	nearest	tenth
"	5	"	50	"	"	"	"	unit
"	51	"	100	"	"	"	"	5
"	101	"	500	"	"	"	"	10
"	501	"	1,000	"	"	"	"	50
"	1,001	"	greater	"	"	"	"	100

III. COEFFICIENT OF FINENESS[2]

The quotient obtained by dividing the weight of suspended matter in the sample by the turbidity, both expressed in the same units, shall be called the coefficient of fineness. The samples shall be filtered through a fine

REFERENCES

1. Baylis, Joha R. Turbidimeter for accurate measurement of low turbidities, *Indust. & Eng. Chem.*, 18, 3: 311 (Mar.), 1926.

2. Report of Committee on Standard Methods of Water Analysis, *Pub. Health Reports & Papers (Transactions of the A. P. H. A.)*, XXVII (1901), pp. 377–391.

alundum crucible or some suitable filter that will remove all the suspended matter. The crucible shall then be dried to constant weight in an oven at 110° C.

For waters high in organic matter, a temperature of 103° C. is recommended for the drying of solids.

The following method is recommended for the determination of hardness by the use of standard soap solution.

REAGENTS

1. *Standard Calcium Chloride Solution*—Dissolve 0.5 gm. of pure calcite (calcium carbonate) with a little dilute hydrochloric acid, being careful to avoid spattering. Wash down with carbon dioxide free distilled water and neutralize with ammonium hydroxide to slight alkalinity, using litmus as an indicator. Make up to 500 c.c. with carbon dioxide free distilled water and store in glass stoppered bottle. One c.c. of this solution is equivalent to 1 mg. calcium carbonate.

2. *Standard Soap Solution*—Make up stock solution by shaking vigorously approximately 100 gm. of pure powdered castile soap in 1 liter of 80 per cent grain alcohol. Let this solution stand at least over night and decant. Titrate against the $CaCl_2$ solution and dilute with 70 per cent grain alcohol until 1 c.c. of the resulting solution is equivalent to 1 c.c. of the standard calcium chloride solution, making due and recorded allowance for a lather factor from at least five determinations. The lather factor will vary from 0.5 to 1.4 c.c. with different soaps. Carbon dioxide free water should be used for lather factor determinations and standardization of the solution. One c.c. of this solution after subtracting the lather factor is equivalent to 1 mg. calcium carbonate.

3. N/50 sulphuric acid
4. N/50 sodium carbonate
5. Phenolphthalein indicator
6. Methyl orange indicator

ANALYTICAL PROCEDURE

1. *Hardness*—Measure 50 c.c. of the water to be examined into an 8-oz. bottle. Add the standard soap solution in small amounts at a time, shaking vigorously after each addition, until a strong permanent lather is secured which will stand for 5 minutes. It is usually satisfactory to add an amount of soap solution equal to the lather factor as the first addition and then, as the end point is approached, to cut the additions of soap solution to 0.1 c.c. or more, depending upon the accuracy desired and the experience of the manipulator. Note and record any false end point which is the dividing line between the calcium and magnesium salts. The final burette reading, after deducting the lather factor, gives the total hardness ("H") in terms of calcium carbonate as p.p.m. when multiplied by 20. (In determining the hardness of acid waters they should first be rendered neutral to methyl orange by addition of N/50 sodium carbonate solution. Samples containing appreciable amounts of free carbon dioxide should be neutralized to faint pink with N/50 normal sodium carbonate solution before testing.) The difference between the false end point and the total hardness indicates the amount of magnesium salts, the balance being calcium salts, all, when multiplied by 20, expressed as p.p.m. in terms of calcium carbonate. If the hardness test requires more than 7.5 c.c. of soap solution, it is best to take an aliquot portion and dilute to 50 c.c. with carbon dioxide free distilled water so that the final lather point will be less than 7.5 c.c. After deduction of the lather factor, multiply the result accordingly to obtain correct hardness value.

(NOTE: If it is desired to express results in terms of gr. per gal. use a 58.3 c.c. sample of water and the results can be read direct as gr. per gal. in terms of calcium carbonate after subtracting the lather factor.)

For field work, the following solution and method is recommended.

Dissolve 100 gm. of pure soap in 1,600 c.c. of 90 per cent grain alcohol. Dilute with distilled water (800 to 1,000 c.c. will be required) until 2.4 c.c. of the soap solution gives a lather with 40 c.c. of a solution of $CaCl_2$ containing 0.25 gm. per liter. The $CaCl_2$ solution may be made up by dissolving the proper amount of pure $CaCO_3$, using the technic described above (see standard soap).

This soap solution is approximately 3½ times as strong as the standard soap previously described and is to be used for field determinations of "zero hardness." For this purpose 40 c.c. of the water to be tested are placed in a 3-oz. cork stoppered bottle and the soap solution added a drop at a time from any convenient type of dropping bottle which delivers 0.05 c.c. per drop. The sample is shaken vigorously after each addition of soap. Three drops should give a permanent lather with 40 c.c. of distilled water or water of "zero hardness."

Directions for titration with erythrosine have been modified.

The drop ratio method for the determination of hydrogen ion concentration has been omitted. It is recommended that the results of mineral analysis be expressed in p.p.m. and milli-equivalents.

The following colorimetric method for the determination of silica is suggested.

REAGENTS

1. Ammonium molybdate reagent:
   30 gm. of ammonium molybdate
   200 c.c. of 1:1 HCl
   400 c.c. of water
2. Standards:
   0.530 K_2CrO_4 in 100 c.c. water
   1 c.c. of this solution is equivalent to 1 mg. SiO_2.
   Permanent standards reading directly in p.p.m. when a 50 c.c. sample is used may be made as follows:

c.c. of chromate diluted to 55 c c.	Equivalence in p.p.m. SiO_2 when 50 c.c. sample used
0.0	0
0.1	2
0.2	4
0.3	6
0.4	8
0.5	10
0.6	12
0.7	14
0.8	16
0.9	18
1.0	20
1.1	22
1.2	24
1.3	26
1.4	28
1.5	30

Procedure—Fifty c.c. of the sample are measured into a tall form Nessler tube. Five c.c. of the molybdate reagent are added. The mixture is thoroughly shaken and allowed to stand about 15 minutes—not longer than 20 minutes. The yellow color developed is then compared with the chromate standards.

The limitations of this method are:

1. It will not determine suspended silica.
2. Phosphates interfere.
3. Strong mineral acids in excess of that present in the reagent will prevent the development of maximum color.
4. Hydrogen sulphide gives a blue color instead of yellow and must therefore be removed.

This method was suggested by L. W. Winkler[1] and modified in the Illinois State Water Survey laboratory by S. L. Neave.[2]

Slight modifications have been suggested in the descriptions for the determination of total and suspended solids and of grease.

A report has been prepared by R. C. Bardwell recommending Rapid Methods for the Analysis of Boiler Waters. These methods include both those for field and for laboratory work. They are not given here in full because they represent well recognized procedures. However, a copy giving the complete details can be obtained from the Secretary of the Committee.

A brief summary of these methods is as follows: It is recommended that combinations of positive radicals should be made with negative radicals in the following order when it is desired to report the results in hypothetical combinations.

Positive Radicals	Negative Radicals
Calcium	Carbonate
Magnesium	Sulphate
Potassium	Chloride
Sodium	Nitrate

Total hardness is determined by means of soap solutions. Alkalinity and acidity are determined by titration with N/50 sulphuric acid and N/50 sodium carbonate respectively, using methyl orange as an indicator. Non-carbonate hardness is determined by means of soda reagent and a volumetric procedure of magnesium is given.

The following method for the determination of *B. coli* by means of brilliant green lactose peptone bile medium is recommended with the proviso that it be used only for water purification plant control.

BRILLIANT GREEN LACTOSE PEPTONE BILE

This medium may be used for parallel planting with standard lactose broth, for water purification plant control, only. It contains brilliant green in a concentration of 1:75,000 and 2 per cent of bile.

REFERENCES

1. *Ztschr. f. anal. Chem.*, 54: 365, 1914.
2. Not published.

Dissolve 10 gm. of peptone and 10 gm. of lactose in 500 ml. of distilled water. Add 200 ml. of fresh ox bile (or 20 gm. of dehydrated bile) and 13.3 ml. of a 0.1 per cent solution of brilliant green (certified dye) in water. Make up to a volume of 1,000 ml. with distilled water, adjust the reaction to a pH of 7.1–7.4 and filter through cotton. Distribute in tubes with inverted vials and sterilize as directed under sterilization. The reaction after sterilization should be 7.1–7.4.

When 10 ml. or more of water are to be planted, the concentration of ingredients should be increased as indicated in the following table:

Amount of Water Sample	Concentration of Ingredients per 1,000 ml. of medium	Amount of medium per tube
1 ml. or less	peptone, 10 gm. lactose, 10 gm. ox bile, 200 ml. brilliant green, 0.1% solution, 13.3 ml.	10 ml.
10 ml. or 100 ml.	peptone, 20 gm. lactose, 20 gm. ox bile, 400 ml. brilliant green, 0.1% solution, 26.6 ml.	10 ml. or 100 ml.
10 ml.	peptone, 15 gm. lactose, 15 gm. ox bile, 300 ml. brilliant green, 0.1% solution, 20 ml.	20 ml.
10 ml.	peptone, 13.3 gm. lactose, 13.3 gm. ox bile, 266.6 ml. brilliant green, 0.1% solution, 17.7 ml.	30 ml.

The medium may be used in the dehydrated form in the following concentrations:

Amount of Water Sample	Concentration of Ingredients per 1,000 ml. of medium	Amount of medium per tube
1 ml. or less	40 gm.	10 ml.
10 ml. or 100 ml.	80 gm.	10 ml. or 100 ml.
10 ml.	60 gm.	20 ml.
10 ml.	53 gm.	30 ml.

(*To be continued*)

PRESERVATION OF HEMOLYTIC AMBOCEPTOR

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THE usual method of the preservation of hemolytic amboceptor is by addition of 50 per cent of sterile neutral glycerin. Phenol 0.4 per cent, and tricresol 0.3 per cent have also been used. It is common experience that the titer of such preserved amboceptor slowly decreases, and it is customary to retest it about every 3 months.

The use of mercuric chloride as a desirable preservative, advocated by Daranyi, warrants consideration. Daranyi prepared a "stock solution of corrosive sublimate; 1.0 gm. of mercuric chloride is dissolved in 250 c.c. of physiological salt solution. Of this solution, 1/20 part by volume is to be mixed quickly with the serum. The corrosive sublimate is present in the serum in a final dilution of 1:5,000

TABLE I

COMPARISON OF TITER OF HEMOLYTIC AMBOCEPTOR ACCORDING TO KIND OF PRESERVATIVE

	Preservative	Titer			Appearance
		May, 1929	May, 1930	May, 1931	
Hemolytic Amboceptor	Glycerin	1:2,000	1:1,200	1:600	Slight cloudiness
	$HgCl_2$ 0.02%	1:2,000	1:1,700	1:800	Clear

(0.02 per cent)." In serum preserved by the mercuric chloride method, Daranyi found after a half year no diminution of titer.

I divided a fresh supply of hemolytic amboceptor, attenuated, into two portions, according to Table I.

In this particular experiment, the titer of the corrosive sublimated amboceptor decreased more slowly than the glycerinated amboceptor, especially during the first year. $HgCl_2$ appears to be a desirable preservative for hemolytic amboceptor.

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1. Gilbert, Ruth. Production of Antisheep Amboceptor in a Mule, New York State *J. Med.*, 22: 286, 1922.
2. Kolmer and Boerner. *Laboratory Diagnostic Methods*, 1925.
3. Daranyi, J. Methods of Obtaining and Preserving Antibodies, *J. Immunol.*, Vol. 15, Nov., 1928.
4. *Manual of Methods for Pure Culture Study of Bacteria*. Society of American Bacteriologists, 1930.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Vital Statistics for Kentucky, 1930—For the state of Kentucky the general death rate in 1930, of 11.3 per 1,000 population, is 0.8 lower than in 1929. There were 1,324 fewer deaths than in the previous year. The causes from which the number of deaths increased in 1930 were meningitis, measles, typhoid fever, infantile diarrhea, diarrhea in adults, infantile paralysis, malaria and cancer. With the probable exception of meningitis the increased rate from the other causes is undoubtedly due to the drought conditions existent in the state. There were 2,468 deaths from tuberculosis, with a rate of 94.4, as against 2,654, with a rate of 103.9 in 1929. This is the first time since enactment of the vital statistics law in 1910 that the tuberculosis rate has fallen below 100.0. Eight hundred deaths were attributed to influenza; 3,239 resulted from this cause in 1929. Cancer deaths increased 213 over the previous year, showing a rate in 1930 of 68.4. The number of births registered increased 283 over 1929, but due to increase in the recorded population, the rate is somewhat lower, being 21.8 as against 22.2 in 1929. The infant mortality rate of 66.5 is the second lowest ever recorded in the state.—*Bull.*, State Board of Health of Kentucky, 3: 5 (Apr.), 1931.

Vital Statistics for New Jersey, 1930—The lowest general death rate, tuberculosis death rate and infant mortality rate ever attained in New Jersey were reached in 1930. Preliminary rates, subject to slight corrections, show that the state death rate for 1930 was 10.63 per 1,000 estimated population. This was the lowest rate ever attained in New Jersey, the previous low being 11.43 in 1927. The estimated midyear population for 1930 was 4,062,930. The rate from all forms of tuberculosis was 69.0 per 100,000 population, which compared favorably with a rate of 90.1 from the same disease only 7 years ago. The death rate from cancer and other malignant tumors, 106.6, was lower than the 1929 rate of 116.4. The latter was the highest ever recorded in New Jersey. The pneumonias showed a decreased rate. For 1929 the rate was 109.5 per 100,000 population and for 1930, 77.4.

Approximately 68,200 births were reported as occurring in 1930, which was equivalent to a rate of 16.79 per 1,000 inhabitants. The low figure for 1930 was merely a continuance of the decline noted since 1917, when the rate was 24.98. The number of deaths of infants under 1 year of age per 1,000 babies born alive was 56.7, which was the lowest infant mortality rate in New Jersey since such rates were first published in 1906. The approximate number of mothers who died as a result of childbirth was 390, or 5.7 per 1,000 babies born alive. This compared with 5.3 for the preceding year.—*Pub. Health News,* New Jersey State Dept. of Health, 16: 85 (Mar.), 1931.

Marriages in New York State—1930—The marriage rate in the state of New York in 1930 was, with the single exception of 1908, the lowest recorded in the last 30 years. The number of marriages was 108,498 and the marriage rate 17.2 per 1,000 population as compared with 114,644 marriages and a rate of 18.4 in 1929.

It is a well known fact that the marriage rate fluctuates in direct response to important sociological and economic phenomenons. The financial panic of 1907 was reflected the following year in a drop in the marriage rate of 22 per cent—the greatest ever recorded in the state. Our entrance into the World War was the primary cause for the low rate in 1918, which was 14 per cent below that of the preceding year. The highest rate for the state (21.6) was recorded in 1920—the marriages in that year including undoubtedly many that were postponed because of war conditions. The second highest rate (21.5) was that of 1907—the third successive year of unusually favorable business conditions preceding the panic in the last quarter of that year and the depression of 1908. The exceptionally low rate of 1930 is a direct consequence of the widespread economic depression which first manifested itself in the late fall of 1929.

The marriage rate according to age had a low point at the youngest age rising to a maximum at 21 years for both brides and grooms and declining to a minimum in the oldest group. There were 2,838 brides and 2,515 grooms below the ages of consent. In 33 marriages the bride was 14 years of age and in 198 marriages, 15 years of age. There were 11 grooms 16 years of age and 84 grooms 17 years old. Most of these young brides and grooms were native born white; of the 33 brides who were 14 years old, 30 were native born white, 1 a native of Canada, and 2 negroes. Of the 198 brides 15 years of age, 178 were native born white, 5 natives of Canada, 5 of Italy, and 10 negroes. Of the 11 grooms who were 16 years of age all were native born white. Of the 84 grooms who were 17 years of age, 79 were native born white, 2 natives of Canada, and 3 negroes. At the farther end of the life span, there were 15 marriages in which the grooms were over 80 years of age; 14 native born white and 1 a native of Germany; the oldest brides were between 75 and 80 years of age. Of these, 12 were native born white, 1 a native of Germany, and 1 of Poland.—*New York State Weekly Health News,* 8: 65–66 (Apr. 27), 1931.

Tuberculosis in India—Tuberculosis has been a most prevalent disease in most Indian cities from ancient times, but there is evidence that it has rapidly increased within recent years, e.g., there has been an increase of 70 per cent in mortality from tuberculosis within the last 10 years in the city of Calcutta. The course of the disease seems to be more acute than in western countries. To understand the epidemiology of tuberculosis in India, it must be remembered that 90 per cent of India's popu-

lation still reside in the villages, and that urbanization, modern industrialism and the introduction of rapid transit facilities have been powerful factors in the diffusion of population during the last 50 years. Certain habits, such as spitting inside habitations, eating and drinking from common vessels, and sleeping together in the same room, are extremely common among all classes of society and favor massive infection. The malnutrition factor appears noteworthy, for the diet of the people in most parts of India has become unbalanced and inadequate within the same period. Another fact of great importance is that infection with the bovine type of tubercle bacillus is practically nonexistent in India. Only 2 or 3 per cent of cattle slaughtered in the slaughter houses show localized tubercular lesions.

Five years' mortality figures in the city of Calcutta show a very low death rate in the earlier years, reaching only 4 per cent by the 15th year. The curve rises rapidly from this age and attains its highest point at 30 years, falling down rather more slowly and reaching about 7 per cent by the 60th year. The initial peak of mortality which comprises nearly 15 per cent of the total deaths from tuberculosis in England and Wales and in most European countries is thus lacking. The Health Officer's report in Calcutta states that 94 per cent of the deaths are from pulmonary tuberculosis. The extremely low incidence among infants and children below 10 years of age is noteworthy. The incidence, however, rises high in the presence of a constant source of infection, e.g., according to a survey of 100 houses containing " open " pulmonary cases, 71.4 per cent of children between 1 and 5 years, and 83.3 per cent of children between 6 and 10 years were found to give positive reactions when they lived in the same room with such a case. What, however, is puzzling to authorities is the low figure of mortality at this age in the presence of a low degree of positive cuti-reactions.

In a series of 52,550 cases attending the Polyclinic of the Calcutta hospitals, the following incidence of tuberculous disease was found: Total number of tuberculosis cases, 1,019, of which the lungs were found affected in 62.8 per cent; glands in 17 per cent; bones and joints, 13.9 per cent; while skin tuberculosis accounted for only 2 in the series. Lung tuberculosis was found to be extremely rare below 10 years. All the forms of tuberculosis attained their maximum incidence between 25 and 30 years, 5 to 10 years earlier than those found in Europe. The duration of life of a case of pulmonary tuberculosis, which depends on the infecting dose, the age, the extent and multiplicity of lesions, the secondary bacterial flora in " open " cases and on the immunity of the individual, is distinctly shorter in India than in Europe. Further, it is shorter in females than in males. Pregnancy and lactation, diabetes, influenza, and kala-azar have been found to shorten the course. The lesions seldom remain localized, rapidly spreading to other parts of the lungs. Massive infection is the rule in a majority of cases. —A. C. Ukil, A Note on the Epidemiology and Pathology of Tuberculosis in India, *Tubercle*, 12: 244–250 (Mar.), 1931.

Provisional Mortality Report for Wisconsin, 1930—For the year 1930, Wisconsin, according to provisional reports, showed 30,261 deaths exclusive of stillbirths, this figure bringing the death rate per 1,000 population down to 10.3, as compared with 10.8 in 1929, 11.0 in 1928 and 10.4 in 1927. The death rate from tuberculosis for 1930 will undoubtedly be the lowest rate from this disease ever recorded in the history of the state. With a total of 1,490 deaths reported for 1930, the death rate was only 50.7 per 100,000 as compared

with a rate of 59.0 in 1928 and 55.2 in 1929. In 1929, with the lowest death rate ever recorded for diphtheria in Wisconsin, there were 79 deaths from this disease and in 1930 there were only 72 deaths reported, bringing the death rate down to 2.4 as against 2.7 and 3.5 for 1929 and 1928 respectively. There were no serious outbreaks of influenza in Wisconsin during 1930, and as a result only 470 deaths from influenza were reported as compared with 1,251 in 1929, reducing the high 1929 death rate of 42.1 to 15.9 in 1930. With the marked decline in the number of cases and deaths from influenza there was a considerable decline in the number of deaths from pneumonia, with a death rate of 72.6 in 1930 as against 77.2 in 1929.

There was practically no increase in the number of deaths from cancer during the past 3 years, the death rate for 1930 being 112.5. The reports for 1930 show a slight decline in the death rate from puerperal causes, 4.8 in 1930 as compared with 4.9 in 1929 and 5.8 in 1928. Epidemic meningitis deaths declined to about one-half, reducing the 1929 death rate of 3.9 from this disease to 2.0 in 1930. As contrasted with these declines in death rates, there was a marked increase in the number of suicides from 451 or a rate of 15.5 in 1929 to 546 or a rate of 18.9 in 1930. The death rate from automobile accidents also increased from 24.1 in 1929 to 26.9 in 1930. Measles and smallpox showed increases for 1930.

With 55,784 births reported for 1930 and 3,134 deaths reported among children under 1 year of age, the provisional infant mortality rate based upon the number of deaths among children under 1 year of age per 1,000 live births reported was 56.2. This is the lowest infant mortality rate ever recorded, in Wisconsin, and with the several hundred delayed 1930 birth reports which remain to be put on record, it is believed that the final figures for infant mortality will be even slightly below 56.2.—*Bd. of Health Bull.*, State of Wisconsin, 5: 21–26 (Jan.–Mar.), 1931.

Suicides in New York State Reach New Maximum in 1930—Suicides in 1930 in the entire State of New York numbered 2,345, the greatest total ever recorded. The suicide rate, 18.6 per 100,000 population, was 22 per cent above the average rate for the preceding 5 years. Compared with 1929 the number of suicides increased in the entire state by 210, in New York City by 148, and in the rest of the state by 62. The increase in suicides in the state occurred mainly among men, the number rising from 1,563 in 1929 to 1,760 in 1930; among women, the increase was but slight—from 574 to 585. In the period 1920–1930 the number of suicides doubled from 1,189 to 2,345 while the population of the state increased by only 21 per cent. Suicides of men rose from 853 to 1,760—an increase of 106 per cent; suicides of women rose from 336 to 585, or 74 per cent.

The proportion of suicides to deaths from all causes in 1930 increased with age from a low point under 20 years to a maximum at 30–39 years, gradually declining to another low figure in the oldest group. In the age group 10–19 years, 12 out of 1,000 deaths were suicides; the ratio was 38 in 1,000 death at 20–29 years, rising to 41 at 30–39 years. The absolute minimum proportion—2 in 1,000 deaths—was recorded in the oldest group, 80 years and over. In New York City the number of suicides in relation to deaths from all causes was greatest between 30 and 40 years—46 in 1,000 deaths; upstate, between 20 and 30 years—35. There were 30 suicides of young persons under 20 years of age in New York City and 18 upstate. All but 1 of the suicides upstate were native born—the youngest, a boy 9 years of age. There were in

New York City 6 suicides of men and 2 of women over 80 years of age; upstate, 22 and 2. Three times as many men as women took their own lives. In the oldest age group, 80 years and over, there were 7 suicides of men to 1 woman. The next highest ratio, 4:1, was between 50 and 70 years. In the youngest ages the disparity was considerably less, suicides among men being only one and one-half times the number among women. Practically two-thirds of the men were between the ages of 30 and 60; the corresponding proportion of suicides among women fell between the ages of 20 and 50.

In about one-third of the suicides, poisonous gas (mainly illuminating gas and carbon monoxide) was the means employed; hanging, in 21 per cent; firearms, 15 per cent; jumping from high places, 10 per cent; and corrosive substances (bichloride of mercury, carbolic acid), 10 per cent. Poisonous gas was the leading means of suicide at all ages to the 70th year; in the older ages, hanging. Next in order of numerical importance were: under 20 years of age, corrosive substances; between 20 and 40 years, firearms; between 40 and 70 years, hanging; after the 70th year, poisonous gas. Among men, the most prevalent methods were: poisonous gas —30 per cent, hanging—24 per cent, firearms—19 per cent; among women, poisonous gas—39 per cent, corrosive substances—17 per cent, jumping from high places—15 per cent. There was considerable divergence in the means of suicide in New York City and in the urban and rural parts of the rest of the state. In New York City: poisonous gas—44 per cent, hanging—15 per cent, jumping from high places—15 per cent; in the urban upstate territory: hanging —26 per cent, firearms—21 per cent, poisonous gas—20 per cent; in rural New York: firearms—30 per cent, hanging—30 per cent, drowning—13 per cent.

There were 29 suicides in state institutions, located outside of New York City; 19 in state hospitals, 7 in state prisons, and 1 each in Craig Colony at Sonyea, Syracuse State School, and the Institution for Defective Delinquents at Napanoch.—*New York State Weekly Health News*, 8: 77–78 (May 18), 1931.

PUBLIC HEALTH ENGINEERING

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THE MILK CONTROL PROGRAM IN TEXAS*

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IN this discussion it will be my purpose to point briefly to some of the accomplishments of the standard milk ordinance program in Texas rather than to attempt to do full justice to all of the progress that has been made. For public health reasons alone the program was adopted by the State Department of Health in 1924, and its promotion since that time has been to provide cities with a means of producing clean safe milk at the lowest possible cost to the dairyman and the consumer.

In introducing the standard milk program in Texas our health officials realized that they were dealing with one of the world's largest industries, and one that affects vitally the future prosperity of the state as well as the health of her inhabitants. Consequently, they knew that the enactment of any law or the enforcement of any legislation which would hinder the industry would be undesirable. Regulations to govern the production of milk should at the same time encourage its wider use. A workable ordinance was therefore one that was fair, impartial, and economical. It was found that the standard milk ordinance was designed with that in mind.

While the standard milk ordinance is local in its application, the State Department of Health was charged with coördinating and unifying the program for the state as a whole—a program that was in the course of 5 years to envelope the entire state. With the passage of the ordinance first by a little east Texas town late in 1924, an old industry was reborn. It was there that dairymen demonstrated the principles of milk sanitation as laid down in the standard milk control code, producing a milk superior in quality and one that could be transported, retained, or consumed at leisure. Milk sanitation there made possible the long haul, providing a market for fluid milk which had heretofore been a perishable product. New possibilities in the field of dairy husbandry were opened. Through standardization a definite milk program was established, and the confidence of the milk drinking public was insured.

Today Texas has some 96 towns operating under the standard milk ordinance. Some of these towns have made enviable records in milk sanitation, and others have done little. Failure may be attributed chiefly to lack of funds to carry on the work, politics, and incompetent inspectors. Notwithstanding these disturbing factors, the program has gone far toward promoting a wholesome respect for clean milk production, and its ever growing popularity speaks for its simplicity and efficiency in operation.

The program is not one of big buildings and much money. Fine barns and expensive equipment are not the prime

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requisites of clean milk production. Such outward camouflaging often cloaks bad methods of operation, and the real fundamentals of milk sanitation may be lost to the inspector in a mass of elaborate construction. Those factors that contribute most to the production of clean milk are simple, and, as outlined by the standard milk ordinance, are within the reach of every dairyman.

The standard milk ordinance is the result of years of study. It is the cream of some 400 nondescript milk ordinances from over a wide geographical area. Of the 25 items listed on the grade sheet not one could be omitted without jeopardizing some phase of clean milk production. A glance at the grade sheet shows the first objective to be dairy herds free of tuberculosis and dairy employees free of communicable disease. No one could dispute the importance of such measures for health protection, especially since bovine tuberculosis contributes 25 per cent of the tuberculosis of the human family. When we add to that the economic losses to the dairy industry due to the ravages of this most dreaded disease, we have some idea of the enormity of the hazard. Texas is fortunate in that it has a relatively small percentage of infected cattle. While other states are spending millions of dollars for the eradication of tuberculosis among cattle, Texas, through the standard milk program and the work of the Livestock Sanitary Commission, has cleaned up thousands of dairy herds, reducing the hazards of tuberculosis without the alarming influence of state legislation.

Because of the standard milk ordinance thousands of dairy barns have been built—barns that are a source of pride to their owners—which provide shelter for thousands of dairy cattle. The standard ordinance has also built a correspondingly large number of milk houses that are symbols of cleanliness and an inspiration for the dairy industry. Sanitation has been introduced on the farm, many health hazards being reduced or eliminated thereby. The incidence of typhoid fever has been reduced by the construction of proper toilets and the systematic analysis of many water supplies.

Through its frank support of complete pasteurization, the standard ordinance has unconsciously thrown a protective barrier around the production of raw milk. The ordinance has exemplified the importance of regular physical examinations for the dairy attendant, thereby aiding the individual in maintaining good health. The principles of the standard milk ordinance are now being taught in the schools, having been added to the courses in dairy husbandry at Texas A. & M. College, and among other schools of higher learning. New interest has been aroused in the production and distribution of the world's greatest food, and new dignity added to the labor that industry entails. Through the inspection service provided by the standard milk ordinance, the health of our people is being safeguarded and the future of a great industry assured.

DISCUSSION

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THE earliest efforts of the State Board of Health of Missouri toward the improvement of municipal milk supplies was in 1923. Under the direction of the division of public health engineering, a coöperative pro-

gram with several cities was started, using an ordinance recommended by the State Board of Health. The program was inaugurated for the following reasons:

1. A high infant mortality rate
2. Requests from several unofficial civic organizations, such as commercial clubs, parent-teacher associations, etc., for information regarding the quality of their respective city milk supplies
3. Requests from city officials for assistance and advice relative to certain problems in milk sanitation
4. Information from various sources indicating unsatisfactory or no city milk ordinances in many instances and ineffective enforcement of existing ordinances in practically every city investigated

In brief, the program provided state aid to any city wishing to control milk sanitation. After an ordinance was passed and enforcement well started, the assistance of the State Board of Health ceased.

After 2 years this work was not proving entirely successful for the following reasons:

1. No regular supervision by the State Board of Health
2. Defects in the sanitary features of the ordinance recommended
3. Difficulty in enforcing the ordinance
4. Lack of adequate state personnel

In 1925 the U. S. Public Health Service Standard Milk Ordinance program was adopted, since it offered solution to many previous difficulties, and because of the increasing evidence of the need of safer municipal milk supplies. For the last 2 years this program has received continuous supervision by the State Board of Health and the U. S. Public Health Service. To date the ordinance has been passed in 26 cities in Missouri, representing a total population of 324,500, whose milk supply is produced under standard ordinance requirements. The total population of all cities having 2,500 and over, exclusive of Kansas City and St. Louis, is, according to the 1920 census, 489,596. Thus, 66 per cent of the population of cities of 2,500 and over, exclusive of Kansas City and St. Louis, are living in Standard Milk Ordinance cities. Surveys and some preliminary work toward the inauguration of milk sanitation programs have been undertaken in 20 additional cities with a population of approximately 100,000.

In the majority of cities accepting the Standard Milk Ordinance program it has been necessary to train inspectors who had no previous milk sanitation experience, since this was the best arrangement that could be effected. We are convinced that the success of a milk sanitation program is directly proportionate to the training and ability of the local inspector, backed by adequate support from the city officials. It is certain that far better results have been possible with the untrained personnel, which has been available, through the system of state and federal supervision than could have been obtained without this supervision. Also, it has been shown that trained local enforcement personnel does better work under supervision, possibly due to moral support and aid or because of periodic check-ups.

Our experience in Missouri cities indicates that, before enforcement of the Standard Milk Ordinance, the weighted average retail raw milk sanitation rating was approximately 50, the weighted average raw milk to plant sanitation rating was 37, and the weighted average pasteurized milk rating was 44. After enforcement of the Standard Milk Ordinance for an average of less than 2 years, the weighted average rating for raw milk showed an improvement of 50 per cent, raw milk to plant showed an improvement of 89 per cent, and pasteurized milk showed an improvement of 68 per cent.

The first rating of these Standard

Milk Ordinance cities indicated that 13 per cent of the milk supply was pasteurized; the last rating indicated that this had increased to 30 per cent. The average increase in milk consumption has been approximately 18 per cent.

In conclusion I wish to say that we have been well pleased in every respect with the operation of the Standard Milk Ordinance program, and feel very grateful to the U. S. Public Health Service for valuable assistance. We have found many difficulties in our path but none that was insurmountable. Probably the most vexing problem at the present time is assuring trained city dairy inspectors reasonable tenure of office. This is a difficulty of real importance wherever the city officials are elected every 2 years, and it has been customary to change inspectors when incumbent officials are defeated.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG, M. D., PH. D.

Death of Dr. George M. Kober—The first Chairman of the Section on Industrial Hygiene of the American Public Health Association, George Martin Kober, M.D., died at his home in Washington, D. C., of heart disease, April 24, 1931. He was one of the four to present papers in a "Symposium on Industrial Hygiene" at the Jacksonville Meeting of the Association, December, 1914, at which time the Section on Industrial Hygiene was organized. Dr. Kober has been a member of the A. P. H. A. since 1896, and was made a Charter Fellow in 1922.

Dr. Kober was born at Alsfeld, Rhine Province, Germany, March 28, 1850, and came to the United States in 1866, graduating from Georgetown University School of Medicine in 1873. He joined the U. S. Army as acting assistant surgeon in 1874, and spent 20 years of his professional life with the military service, principally in the West during the Indian troubles.

Dr. Kober was greatly interested in Indian welfare and championed it to the end of his life. He also acquired considerable holdings in land in Modoc County, Calif., which was put to grazing. At the same time, in Washington, he was made President of the Sanitary

GEORGE M. KOBER, M.D.

Improvement and Housing Companies, and was considered a housing expert. When he returned to Washington in 1890 he was made Professor of Hygiene at his Alma Mater and in 1901 became the Dean of the School of Medicine,

which position he held until 1928, when he was made Dean Emeritus and one of the regents of the university. He received the degree of LL.D. in 1906, and Litt.D. in 1923, from Georgetown University.

Just after the beginning of the century he became interested in industrial hygiene through his work in the housing of workers, and in 1902 his student, Dr. C. L. F. Doerhing, made the first survey in America of what, in our modern conception, would be called "industrial hygiene" (*U. S. Labor Bulletin, No. 44*, 1903). This work was done under that venerable Commissioner of the Department of Labor, the Hon. Carroll D. Wright.

Dr. Kober was Chairman of the Industrial Hygiene Section of the International Tuberculosis Congress in 1906. In 1908, while Secretary of President Roosevelt's Homes Commission, he headed a survey of the government industries in Washington, an extensive report of which was published in *U. S. Labor Bulletin No. 75*, under the title, "A Report upon Industrial and Personal Hygiene."

He was very prominent as an organizer and official in professional and philanthropical societies and spread his interest in industrial hygiene through the various ones with which he was connected, such as the Association of American Medical Colleges, of which he was president in 1906, the Association of American Physicians, of which he was secretary from 1907 to 1916, the National Tuberculosis Association, of which he was president in 1915, the 15th International Congress on Hygiene and Demography, which met in Washington in 1912, the Pan-American Scientific Congress (also held in Washington) in 1916, and the medical and charitable organizations of Washington, in which he held practically all offices at some time in his life. He also had many friends in Europe, particularly in Germany.

In 1916 he gathered a group of investigators and specialists in the field and with Dr. William C. Hanson as coeditor produced the well known volume, *Diseases of Occupation and Vocational Hygiene*. In 1920 he wrote a monograph, *Tuberculosis in Relation to Occupation*, and in 1924 was senior editor of Kober and Hayhurst's *Industrial Health*, which comprised the collaboration of 35 authors. He did practically all of his writing in long-hand and in a fine, closely written, although easily legible style.

According to his obituary in the *Journal of the American Medical Association*, he is said to have been the first to point out the agency of flies in the transmission of typhoid fever (in 1892). He established the Kober Foundation in Washington some 5 years ago. He turned the attention of his last years to his Reminiscences, which were published in two volumes only last year.

For the first few years after the formation of our Section on Industrial Hygiene he continued active in it, only ceasing when sickness in his near kinsfolk (he was a bachelor) and the conservation of his own health compelled him to restrict his activities and remain in Washington, where, however, many will remember him as a genial and kindly counsellor, usually to be found at the Cosmos Club. E. R. H.

A Guide-Book for Safety Education—This 89-page bulletin in paper covers has a foreword by William John Cooper, U. S. Commissioner of Education, in which he stresses the importance of teaching safety in the schools and finding room for the subject, thus:

> The proper remedy for an overcrowded curriculum is a continuing survey with prompt exclusion from the course of study of obsolete materials and of everything which may be

learned when needed in other ways or at other times and the inclusion in their stead of materials which must be mastered at a comparatively early age unless pupils are to risk loss of life or suffer the loss of bodily powers which may handicap them throughout life.

The book has been very carefully compiled and intergraded for the primary and intermediate grades and secondary schools. The last portion handles the accident question in two columns, the one entitled "Objectives," and the other "Materials and Activities" for the prevention of automobile accidents, fire, railroad, water transportation, home, electrical, gas, aviation, school, industrial and forest relations. There are similar columns for first aid, and for vocational schools, with a final chapter on extra-curricular activities. There is a selected bibliography including sources of certain free materials, slides and films, but no index or table of contents. The introduction is by Albert W. Whitney, Vice-President in Charge of Education, National Safety Council.—National Bureau of Casualty and Surety Underwriters, New York, N. Y., 1931. E. R. H.

The Effect of Variations in Relative Humidity upon Skin Temperature and Sense of Comfort—From the Conclusions: The effect of relative humidity upon the sense of warmth is in accordance with the effective temperature concept for dry bulb temperatures between 60° to 80° F. The magnitude of the effect obtained on the average for the four subjects and the investigator was somewhat less than would have been expected from Yaglou's thermometric chart. A difference of 50 per cent relative humidity corresponded, in its effect upon the sense of warmth, with a difference of 1.7° F. in dry bulb temperature at 61–62° F. at a constant relative humidity, and with a difference of 4.0° F. at 70° F. The rates calculated from Yaglou's thermometric chart are 2.5° F. at 61° F., and 4.6° F. at 70° F. on the average for different humidities.

Relative humidities of 70 per cent and above cause an uncomfortable feeling of wetness at 70° F.—Unichi Miura, *Am. J. Hyg.*, 13, 2: 432–459 (Mar.), 1931. E. R. H.

The Behavior of Lead in the Animal Organism, II. Tetraethyl Lead—Summary and conclusions:

1. These experiments show that tetraethyl lead is absorbed through the skin.
2. The initial distribution of the lead in the tissues in rapid tetraethyl lead absorption corresponds to that of an oil-soluble material, and indicates therefore that some portion of the tetraethyl lead is absorbed and circulates as such.
3. However, tetraethyl lead is rapidly decomposed by the tissues, including the skin, so that only a small portion of the lead found later in the blood is in the form of tetraethyl lead.
4. As a net result, after a period of from 3 to 14 days, all of the lead in the animal tissues is distributed in a manner characteristic of water-soluble lead compounds.
5. In small dosages the factors of rapid decomposition and low concentration in the blood so interfere with the distribution of tetraethyl lead as such, as to prevent its primary absorption by the nervous system.
6. Even when absorbed as the tetraethyl compound, the excretion follows quantitatively that of water-soluble lead compounds.
7. Tetraethyl lead poisoning is therefore not different from lead poisoning occasioned by other lead compounds.
8. Evidence is adduced showing that tetraethyl lead absorption from gasoline in concentrations not in excess of 0.1 per cent is inappreciable.

—Robert A. Kehoe and Frederick Thamann, *Am. J. Hyg.*, 13, 2: 478–498 (Mar.), 1931. E. R. H.

Treatment of Tetanus, Report of Two Cases—Regarding antitetanus serum there is an unanimity of opinion as to its effectiveness as a prophylactic, whereas some element of doubt has been expressed as to its therapeutic value in certain cases in which the disease is already established. This communication

embodies a report on the treatment of two cases of tetanus with massive doses of antitoxin given within a short interval after admission to hospital. The patients manifested the disease in its most severe form, with a very short incubation period in each case.

The first case was that of a boy, 9 years of age, admitted to the hospital on August 20, 1930, who had run a fish-hook into his thumb 10 days prior. On the 6th day, the symptoms developed with stiffness in the neck and locked jaw, becoming progressively worse until most marked symptoms were present on admission (described). The second case is that of a boy 10 years of age, admitted to the hospital, January 6, 1931, who had been injured in the face by a stick of wood which had produced a small punctured wound. The symptoms began 3 days after the injury, and were typical on the 6th day when admitted (described).

The method of treatment consisted of very large doses of tetanus antitoxin, 2,867,500 units in the first case, and approximately 800,000 units in the second case, given by a continuous intravenous method in which the antitoxin was introduced in a 5 per cent glucose-in-saline solution. It was noted that in spite of the large amounts of protein given intravenously, practically no protein was excreted by the kidney and no damage was occasioned by the tricresol contained in the antitoxin. Both cases recovered, without complications. E. R. H.

Eyes Saved in Industry, the Experience of 583 Companies—This is *Publication No. 62*, a Joint Study by the National Safety Council and the National Society for the Prevention of Blindness, 23 pages, illustrated, tables and appendix. Price 15 cents. (450 Seventh Avenue, New York, N. Y.) E. R. H.

The Effect of Irradiation with Ultra-Violet Light on the Frequency of Attacks of Upper Respiratory Disease (Common Colds)—Summary:

1. A group of adult volunteers, numbering 363, was kept under observation from September 29, 1929, to May 31, 1930, a period of 35 weeks, and a vigorous effort was made to secure reports of all cases of upper respiratory disease (common colds).

2. From this number, approximately one-half were selected at random for irradiation, which was given over the first 31 weeks of the period. Mercury-vapor lamps were used and the intensity of erythema-producing rays was measured bi-weekly. The dosage was light to moderate, the individuals being stripped to the waist and exposed, either on chest or back on each occasion, to that dose which, from previous experience with the subject, seemed likely to produce only a minimal erythema.

3. Total incidence for the period was slightly higher for the irradiated (receiving more than 10 treatments) than for the controls. Also cases of a more severe type, as evidenced by absence from duty and confinement to bed, by occurrence of fever, by productive cough or by long duration, were just as frequent in the irradiated as in the control group.

—James A. Doull, Mary Hardy, Janet H. Clark, and Nathan B. Herman, *Am. J. Hyg.*, 13, 2: 460–477 (Mar.), 1931. E. R. H.

Public Safety—This is a monthly publication for popular use by the National Safety Council, 20 North Wacker Drive, Chicago, Ill., illustrated, a few advertisements, averaging 35 pages. E. R. H.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Observations on the Assay of the Antineuritic Vitamin—It has been shown that since rats will develop signs of polyneuritis with a small amount of the antineuritic vitamin in the diet it appears that the symptoms of polyneuritis in rats may indicate an insufficient amount of the vitamin rather than its complete absence.

In the experiment here reported diets of various composition were used with a view to ascertaining which were the most favorable for the production of polyneuritic symptoms in rats. A table is given showing the composition of the different diets and the number of rats showing polyneuritic symptoms.

Tests were also made in which six antineuritic concentrates were injected subcutaneously or intraperitoneally. The results show that as the dosage approaches the minimum curative amount some of the animals will be cured and others will not. In this experiment, some of the rats were cured after 5 or 6 previous attempts, and 1 rat was cured after the 11th attack.

Other investigators have succeeded in curing rats that had had more than 2 attacks and others have reported cures after the 6th attack. However, it would probably not be safe to test a preparation on a group of rats all of which have had more than 2 or 3 previous attacks. —W. H. Sebrell, E. Elvove, *Pub. Health Rep.*, 46: 917 (Apr. 17), 1931.

The Unsaponifiable Lipoids of Lettuce. I. Carotene—The purpose of this report is to record a few observations upon the properties of carotene and to present further proof of the vitamin A activity of this substance from lettuce. During an investigation of the unsaponifiable lipoids of lettuce some brilliant, red, pleochroic crystals separated from a methyl alcohol solution. These crystals proved to be carotene. Approximately 200 mg. were isolated from 10 kilos of dried lettuce, representing 140 kilos of fresh leaves. Carotene crystallizes in the hexagonal system. Carotene solutions may be bleached by heat, ultra-violet light, and by the presence of autoxidizable fats. The physiological activity of carotene was determined by the curative method.

Rats whose diet had been devoid of vitamin A were used when growth had ceased and ophthalmia was usually marked. Carotene in doses of 0.005 mg. per day was always sufficient, except in abnormal cases, to cause a marked increase in weight and recovery from ophthalmia. Cases which failed to respond to carotene treatment always showed other abnormalities, urinary calculi being often present.

From the growth curves it is noted that most of the cases average 3 to 5 gm. gain per 0.005 mg. of carotene, the amount contained in the ordinary 1 drop dose. An explanation of the unusual physiological and chemical properties of carotene must await further information on the structure of the molecule and on the probable electronic alterations which it may undergo.—H. S. Olcovich and H. A. Mattill, *J. Biol. Chem.*, 91: 105 (Apr.), 1931.

The Antiscorbutic Potency of Apples. II—Previous experiments (*Biochem. J.*, 24: 82, 1930) have indicated that (1) Bramley's Seedling is much more potent in antiscorbutic activity than other varieties tested; (2) there is no indication that the age of the tree,

the soil or the season has any effect on the antiscorbutic activity of the apple; (3) there is little deterioration of the vitamin when apples are stored at 1° C. in the air (cold storage) or at 10° C. in an atmosphere of approximately 10 per cent oxygen, 10 per cent carbon dioxide and 80 per cent nitrogen (the loss being greater in the "gas" stored apples); and (4) heating Bramley's Seedlings in their skins at 115° C. for 50 minutes has little effect. The present paper deals with a continuation of these studies. The varieties tested for antiscorbutic activity were Newton Wonder and Lane's Prince Albert, the first being taken from 15-year old trees and the second from 15- to 20-year old trees. The apples were stored at a constant temperature of 1° C. and weekly tests were made. It was shown that:

1. Newton Wonder apples have a vitamin C content of the order of that of Cox's Orange Pippin, while Lane's Prince Albert falls between the Bramley's Seedling and the Cox's Orange Pippin.

2. Bramley's Seedling apples can be frozen at 20° and stored at this temperature for 4 months without losing appreciably in antiscorbutic activity.

3. Bramley's Seedling apples gathered at the end of July were not more active than the normal apple from the same plantation gathered in October.

4. Bramley's Seedling apples stored at 3° in air for 5 months do not lose any of their antiscorbutic activity.

5. The concentration of vitamin C in the tissue of the apple increases as the skin is approached from the core and is more than 6 times as great in the peel as in the flesh near the core.

—Mary Forrest Bracewell, Franklin Kidd, Cyril West and Sylvester Solomon Zilva.—*Biochem. J.*, 25: 138, 1931.

The **Antiscorbutic Potency of Apples. III**—In comparing the potency of different varieties of apples, a marked difference between the antiscorbutic activity of the Bramley's Seedling and the King Edward was observed in spite of the fact that they resemble each other in so many respects. In this experiment an attempt was made to determine whether a relationship existed between the nitrogen content and the antiscorbutic activity of the apple. A table is given showing the tests as carried out. It was found that King Edwards containing about 0.0307 per cent of nitrogen were about 1.5 times as potent in vitamin C as apples of this variety containing about 0.0387 per cent of nitrogen. No significant difference in the vitamin C content was found between Bramley's Seedlings containing high and low quantities of nitrogen.—Mary Forrest Bracewell, Thomas Wallace and Sylvester Solomon Zilva, *Biochem. J.*, 25: 144, 1931.

The Effect of Acidity on Lactobacillus Acidophilus Cultures—From the results heretofore reported it was concluded that *L. acidophilus* milk cultures could be stored at either refrigerator or room temperatures for several days without any considerable destruction of the organisms provided the original acidity was not too high. The results given in this report were obtained upon milk cultures of *L. acidophilus* that were high in acidity when stored. A decrease in the number of organisms took place at an acidity of approximately 1.2 per cent in all but one strain. At higher acidities of approximately 1.5, 1.6, 1.7, and 1.8 per cent, a still greater destruction of organisms took place. The acidity at which this greater destruction occurred varied with the strain. It was indicated that the particular sample of each strain that gave the highest count before storage usually gave the highest count of the series after storage at 9° or 24° C. The results obtained indicated that the acidity at which the maximum number of organisms was secured during incubation of a culture was an index as to the acidity at which to place cultures in refrigerator storage.

—Luther A. Black and J. C. Harris, *J. Dairy Sci.*, 14: 198 (May), 1931.

The Vitamin A Content of Oats—This is a report of an investigation made of the vitamin A content of whole hull-less oats and of the acetone-extracted oil of the whole hull-less oats. Rats 28 to 30 days old and weighing 50 gm. were placed on a vitamin A free irradiated basal diet, supplemented with dried brewer's yeast to furnish vitamins B and G. Definite ophthalmia usually developed within 25 to 35 days, at which time ground whole hull-less oats as the sole source of vitamin A replaced the same percentage of starch or Crisco, or parts of both the starch and the Crisco in the diet. The test period was 8 weeks. It was found that whole hull-less oats are almost if not totally lacking in vitamin A, and death occurred when whole oats were fed at levels of from 0.6 to 5 gm. daily. When acetone-extracted oat oil was included in the diet, the condition of the animals was slightly improved. All but one animal lived throughout the 8-week period but growth was very slow or completely arrested.

From these results it is concluded that oat oil contains a small amount of vitamin A. When 8 drops of cod liver oil was given, ophthalmia was completely cured in 7 to 14 days, which indicated that the poor condition of the animals was not due to a toxic effect of the supplement but to a deficiency of vitamin A in the oat oil.—Clara R. Meyer and Rossleene Arnold Hetler, *J. Agri. Res.*, 42: 501 (Apr. 15), 1931.

Utilization by Normal Adult Subjects of the Calcium and Phosphorus in Raw Milk and in Ice Cream—The subjects used in this experiment were 10 normal adults, 5 of whom were irradiated daily for a period of 5 minutes at a distance of 30 inches from the arc. The diet, which was somewhat acid-forming, as is common throughout this country, consisted of ground lean round of beef, white bread, polished white rice, raw apple, orange juice, prunes, and oleomargarine. The variables of the diet were ice cream and raw milk. It was found that for the non-irradiated subjects, the calcium of ice cream gave the more favorable balance, while for irradiated subjects, the calcium of fresh milk was slightly better. The non-irradiated subjects showed calcium balances at least as favorable as those of the irradiated subjects. The non-irradiated subjects also showed somewhat better phosphorus balances than the irradiated subjects, but practically no differences appeared between the milk and ice cream periods.—Martha M. Kramer, Myra T. Potter and Isabelle Gillum, *J. Nutrition*, 4: 105 (May), 1931.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

CHILDHOOD tuberculosis is commanding a great deal of attention at present. Almost every medical and public health journal of recent date contains one or more articles upon some phase of this subject. It is common knowledge that there has been a steady and consistent decline in mortality from tuberculosis during the past two or three decades. While this has been most marked in countries where intensive public health work directed against tuberculosis has been carried on, it is none the less true that a decline is noted also in other places where very little, if any, concerted effort is expended in controlling this disease.

In the United States a considerable decline in tuberculosis death rates has taken place at all age levels, being most marked in childhood, and among males between 20 and 45 years of age, and showing the least reduction in females between the ages of 15 and 20.

In 1923, Dublin [1] predicted that a tuberculosis death rate of 50 per 100,000 population would not be far from the actual figure in the year 1930. While the rate for the whole Death Registration Area has not yet reached that figure, it is tending toward that rate and in a number of individual places has actually reached it. What Dublin stated then is just as true today:

> The tuberculosis movement must not rest on its laurels nor be allowed to drift along easy ways. The disease is on the decline. This is an opportune time to apply even greater energy along approved lines, that there may be no diminishing but rather cumulative returns in life saving.[1]

During the period under consideration much research has been directed along lines of childhood tuberculosis. The more recent investigations have altered considerably our conception of tuberculosis in children and its relation to adult tuberculosis. Our emphasis of the relative value of the various means of diagnosis has shifted and a new classification of the types of tuberculosis has replaced the old. The extensive use of the tuberculin test and more refined technic in the manipulation of the roentgen rays in the diagnosis of childhood tuberculosis have given us a more definite and clear-cut picture of the disease.

It has been noted for some time that the morbidity from tuberculosis and the mortality do not coincide. The results of tuberculin testing reveal varying percentages of positive reactions depending upon age, opportunities for infection, type of community, racial factors, etc. During school age the death rate from tuberculosis is relatively low while the infectivity as shown by tuberculin tests is high. Myers [2] in his new book, *Tuberculosis Among Children*, devotes a whole chapter to consideration of the incidence of tuberculosis in children. The chapter is summarized as follows:

1. Tuberculous infection in this country is by no means universal among children.
2. The incidence of infection among school children has been found to vary from 10 per cent to 90.2 per cent depending upon the opportunities for exposure to tubercle bacilli.
3. The tuberculosis of a community is reflected in its children.
4. Tuberculin tests applied to all children of a community is the best method of approaching the tuberculosis problem. Among the positive reactors will be found children with tuberculous disease, and among their adult associates will be found open cases of tuberculosis previously unrecognized.

Myers also points out clearly that tuberculosis is largely a family disease, and that its prevention in childhood must begin in the family group.

> When tuberculosis exists in the family, the infant should be separated from the tuberculous member as soon after birth as possible. This should be accomplished before infection has occurred, but if the child has already been infected, the separation should be provided for at the earliest possible time. Contrary to a rather general belief the infant who reacts positively to the tuberculin test is in danger from further infection. Every physician should test rather frequently with tuberculin each infant under his care, and if possible make X-ray studies of the chests of the close associates.

Pasteurization of the milk is emphasized as well as avoidance of adult infection. Everyone interested in this recent work with childhood tuberculosis should read Myers's book from cover to cover. At the end of each chapter are references to original sources.

As an excellent companion to Myers's book one should have at hand the convenient brochure, *Childhood Type of Tuberculosis,* by Chadwick and McPhedran, published as diagnostic aids by the National Tuberculosis Association.[3] The childhood and adult types of tuberculosis are clearly differentiated. The diagnosis depends upon the history, symptoms, physical signs, tuberculin test, X-ray evidence and the exclusion of other causes that might produce similar conditions. It is emphasized that the diagnosis of childhood tuberculosis cannot be based upon any one sign or symptom.

> Many children have the childhood type of tuberculosis without manifesting any symptoms that can be ascribed to the disease, although they may have a progressive lesion. . . . The tendency to tire easily is often noted and may be said to be the most common symptom in these children.

These authors, as most of the modern workers in the field of childhood tuberculosis, lay most stress upon a careful history, the tuberculin test and the roentgenogram.

According to these authorities,

> A positive reaction to the tuberculin test always means infection with tubercle bacilli, but it does not necessarily indicate disease, or whether it is active or latent. The Mantoux or intracutaneous test is more accurate, and with it a slightly larger number of reactors will be obtained than is possible with the Pirquet technic.

Referring to the value of the X-ray it is stated:

> A roentgenogram is indispensable in the examination of a child's chest. Without it a positive diagnosis of the childhood type of tuberculosis cannot be made. Furthermore, a physician, however good a clinician he may be, is not justified in excluding tuberculosis without checking his physical examination of the chest with the evidence that only an X-ray film can give.

Chadwick has shown also that weight as an index of tuberculosis is fallacious. In either the childhood or the adult types of the disease we may find underweight, average weight or overweight children. If we take only the underweight children many cases of childhood tuberculosis will be missed.

Tuberculosis is particularly insidious in young women from 15 to 20 years of age. At this period any undue strain may cause a childhood type of tuberculosis to take on the characteristics of the adult type. A number of recent studies have been made which show that the adolescent years are especially dangerous, and should therefore be protected against any severe stresses or strains.

A survey of tuberculosis in certain schools in Colorado[4] brings out some very interesting points:

> 1. The statistics for the mortality and morbidity of tuberculosis in children today and 10 years ago are not comparable.
>
> 2. The number and size of positive reactions increase in children commensurate with contact and the age as noted by Dickey.
>
> 3. The incidence of tuberculous infection among children varies greatly in different parts

of the country and is influenced by climatic and other environmental factors.

4. A survey for tuberculosis in the school of a good community composed largely of health seekers, when contact with the disease is unusually great, showed 36.4 per cent of 283 children from 4 to 15 years of age to be infected. This is only a moderate increase over the incidence noted in non-tuberculous communities.

5. Roentgen studies of the 103 children giving positive reactions revealed childhood tuberculosis in 19 or 6.7 per cent of the whole group. An average for the country at large varied from 1 to 4 per cent.

6. No child with the adult exudative type of tuberculosis was found.

7. Most of the children reacting positively and those having active childhood tuberculosis were not born in Colorado.

8. Climatic factors in Colorado apparently exert a favorable influence in the protection of children against active tuberculous infection.

9. In this study the father was the source of infection in 64.8 per cent of the children giving positive reactions and mothers in only 12.6 per cent.

10. Symptoms of fatigue, undernourishment and a history of frequent colds are not reliable aids in the diagnosis of childhood tuberculosis.

The practical conclusion to all this discussion is that every community should make ample provisions for the tuberculin testing of its childhood population and for the proper follow-up with X-ray examinations.

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3. Chadwick, Henry D., and McPhedran, F. Maurice. *Childhood Type of Tuberculosis*. Natl. Tuberculosis Assn., 1930.

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Sex Education in Childhood

THE May issue of *Child Study* is given over entirely to the consideration of sex education in childhood. It contains a number of informative articles on various aspects of sex in childhood by such well-known authorities as Marion Kenworthy, Leonard Blumgart, Mrs. Cecile Pilpel, Floyd Dell and Dr. Charles W. Margold. In the editorial introduction Marion Kenworthy aptly states:

Sex education of an ideal sort can only be accomplished through a consistent constructive handling of the parent-child relationships. . . . The most effective way to spread this important educational movement is through active work with parents; for the emotionally balanced child of today is the mature parent of tomorrow.

The Parents' Rôle in Sex Education is clearly presented by Dr. Blumgart. Among other important points in his well balanced article he states:

Just as children use their parents as models in all other spheres, so also are they models in their sex life, though perhaps in a more subtle but no less significant way. It is, therefore, most important that parents should understand the growth and development of the sex drives in human beings.

There is also in this interesting issue a brief discussion by Dr. Bernard Glueck of Sigmund Freud's criticism of society.

There appear the usual parents' questions and discussions, book reviews, and news items.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

How Much Nurses Knew about Obstetric Nursing in 1930 as Revealed by a Survey Made by the Subcommittee on Obstetric Teaching and Education of Nurses and Nursing Attendants of the White House Conference on Child Health and Protection—Graduates of hospital nursing schools are doing obstetric nursing in hospitals as "special," "head," or "staff" nurses, and in homes as "private duty," "hourly," "visiting," or "maternity and infant hygiene" nurses.

What Nurses in these Positions Are Being Asked and Expected to Know How to Do:

1. Find pregnant mothers and teach them their need for medical care during pregnancy and persuade them to go to a doctor

2. Give instruction to fathers and mothers individually and in class groups about

(a) The mother's hygiene during pregnancy and how it may be fitted into the daily régime of the home

(b) Preparation for the baby, including his bed, his toilet supplies and the care of them

(c) Preparation of delivery supplies and a plan for the mother's care during delivery and the lying-in period

(d) Care of the baby, including his bath, his rest, his exercise, his food and his daily régime in relation to the needs of the family

3. Observe and question the mother to learn about symptoms and discomforts needing attention—including simple urinalysis and measuring the systolic blood pressure

4. Study the mother's home surroundings and family relationships so as to discover—and help to solve—any problem which in any way may disturb her peace of mind

5. Consider the health of every member of the family—teaching the fundamentals of personal and home hygiene and arranging for health examinations, the correction of defects, the following of treatments or advice

6. Help the doctor or midwife during labor and delivery

7. Give—or teach some responsible person to give—the necessary care to mother and baby during the days that follow

8. Teach the family why a well baby needs continuous medical supervision and why a mother needs an examination by a doctor after the baby is 6 weeks old, and help to arrange for them and for further care when that is indicated

9. Keep the doctor of hospital informed by sending a detailed report of each visit including findings and advice

How the Nurses Questioned Were Chosen:

There were three groups of them:

1. Private duty nurses registered in 1930 for obstetric nursing in the 93 Nurses' Official Registries—each registrar was asked to send the names of 10 nurses to whom the questions could be submitted.

2. Nurses graduating from schools of nursing in 1930 and taking the state board examinations in the summer months. Each board of examiners was asked to present the questions to its applicants, with the request that they be answered, not for credit, but as a contribution to the work of President Hoover's Conference.

3. Nurses taking postgraduate courses in public health nursing in 9 universities in 9 states, and writing examinations in the summer of 1930. The directors of the courses presented the questions as supplementary to their examinations in much the same way as the state boards of examiners did to the second group.

These Were the Two Questions Asked:

1. State what you consider constitutes complete care for a mother from the beginning of pregnancy until the baby is 6 weeks old (29 items in the detail of that care were listed for the nurses to check).

2. How can maternal mortality be prevented?

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

Conclusions from the Returns:

Sixteen hundred and twenty-two nurses returned their answers to these two questions. Only 17.9 per cent mentioned a physical examination and continuous medical supervision during pregnancy as an essential element in adequate maternity care; 24.9 per cent mentioned an aseptic delivery; 8.7 per cent postpartum medical care; and only 5 per cent postpartum nursing, to give only a few of the figures. It was clear that the nurses did not know what adequate maternity care is.

A large number of nurses did not even answer the question about preventing maternal mortality. Some answered it in a way to indicate they had no idea what maternal mortality meant.

And so we must conclude that, with few exceptions, nurses do not know that many of the deaths of mothers in childbirth can be prevented, that obstetric nursing plays a part in that prevention or that the great number of those deaths in this country is a national problem that challenges every doctor, nurse, and health worker who comes in contact with pregnant mothers.

Where the Public Health Nursing Group Stood:

The best answers to the questions came from the students in a postgraduate course in public health nursing who had recently attended an institute in obstetric nursing.

CONCLUSION

This hasty study has shown that the teaching of obstetric nursing has been inadequate. Just how this situation can be improved will have to be worked out by a committee especially interested in materity care and

. . . qualified to develop methods for and to stimulate the adoption of better teaching of obstetric nursing. Such a committee would need funds and a full-time secretary who should be a nurse who knows obstetric nursing. Such a committee should work closely with the National League of Nursing Education and the Committee on the Grading of Nursing Schools to avoid duplication of effort.

It will be some time before the work of such a committee can be finished. In the meantime those improvements that can be stimulated by an appeal from the White House Conference to all hospital trustees, medical boards, superintendents, directors of nursing, boards of nurse examiners and nurses' associations should be encouraged.—

Next month we will give a summary of the recommendations of this committee. —The White House Conference on Child Health and Protection. Excerpts from the Report of the Subcommittee on Obstetric Teaching and Education of Nurses and Nursing Attendants, *Am. J. Nurs.*, XXXI, 5: 581–585 (May), 1931.

This Official Health Agency Has a Completely Generalized Program —Memphis, Tenn., is unique in that the Health Department nursing staff, numbering 40, carries on an almost completely generalized public health nursing service. Two nurses do delivery service and another nurses the major communicable diseases in the homes. The program of the nursing service includes bedside nursing care as pay, part-pay and free service, school nursing, child hygiene, preschool, prenatal and postnatal care, tuberculosis and communicable disease nursing. It is paid for entirely by taxation. The fees collected for nursing care and delivery service go into the city treasury and do not alter the budget of the Division of Public Health Nursing.

Health Department nurses lend assistance to private physicians at deliveries where a fee of $5 is paid for the first 4 hours and $1 for each succeeding hour. These nurses also assist with all cases delivered by the out-patient department of the City Hospital. The two delivery nurses and another nurse from the Health Department assist with the prenatal clinics of the out-patient department of the City Hospital which are under the department of obstetrics in coöperation with the University of Tennessee.

All calls for the delivery nurses of the Health Department are handled by the City Hospital telephone exchange operator. The bag equipment for private as well as out-patient cases is furnished by the maternity department of the City Hospital. All cases are referred to the Health Department nursing staff for prenatal and postnatal care.

This generalized nursing program, completely tax supported, grew out of a survey of the city's health and hospital facilities made in 1924. A second appraisal of the health and hospital facilities was made in 1930. The following is a quotation from the report of the last survey:

> Since January 1, 1926, the number of cases delivered by the Out-Patient Department has shown a 100 per cent increase, but the most marked increase has been among cases for private physicians which at the end of 1929 increased to a number five times as large as the number delivered in 1926. The average number of deliveries per month for 1929 was about 25 for private physicians and about 50 for the Out-Patient Department. The large number of births occurring in hospitals in Memphis reduces proportionately the responsibility of the Health Department for a home delivery service; in 1929, 55 per cent of the total births occurring in hospitals, 67 per cent of the white and 38 per cent of the colored (84 per cent of all colored births were registered at the Out-Patient Department prenatal clinics).

The Memphis Health Department Division of Public Health Nursing now feels that the main objective of their maternity program should be to find prenatal cases earlier in pregnancy, get them under competent medical supervision earlier and increase the number of visits per case.—Bride L. Cawthon, Delivery Service in an Official Public Health Agency, *Pub. Health Nurse*, XXIII, 5: 235, 236 (May), 1931.

Miss Gardner Wins the Saunders Medal—At a meeting of the Advisory Council of the American Nurses' Association in Atlanta, Ga., May 4, it was announced that the Walter Burns Saunders Medal Committee had been unanimous in its selection of Mary Sewall Gardner of Providence, R. I., as the recipient of the medal for distinguished service to her profession.

Miss Gardner is probably best known to the rank and file of public health nurses through her book *Public Health Nursing* which has been translated into several languages and which is known as the standard textbook in public health nursing throughout the civilized world. It was not this book of Miss Gardner's which influenced the Medal Committee, however, as writing was the only service excluded in determining who should receive the award. Miss Gardner for the past 20 years has been closely identified in her professional career with the dramatic development of public health nursing. Her colleagues call her the "dean of public health nursing."

The Saunders Medal Committee announces that application for the 1932 Saunders award may be submitted at any time during the coming months. Rules for eligibility were given in the Public Health Nursing Section in the April, 1930, *American Journal of Public Health*.—June *Bulletin* of the American Nurses' Association, 1931.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Next Is Montreal!—For those concerned with any phase of public health education Montreal is the next source of ideas and information.

The Public Health Education Section members' dinner Monday night will take up several questions of vital interest touching health education progress.

Radio, amateur movies and exhibits will have a session.

A half day will be given to high school health instruction.

Canadian health workers will entertain and instruct at a luncheon.

And one luncheon session will undertake to answer all of the unanswered questions!

What question would you like to have answered?

What question would you like to answer?

Please tell the editor of this department.

Racine Listens In—Most figures as to the number of radio listeners are guesses, but Racine tried for facts.

In the week of May 11 to 16, Health Department nurses were instructed to inquire at each home where they made a call, whether or not the family was in the habit of listening to the Health Department radio programs, inaugurated April 1, 1931. These calls were not made for the purpose of checking up on radio, but were the regular calls made by nurses for other purposes. They represent all parts of the city and all educational and economic levels without selection.

The question asked was simply whether the family was in the habit of listening to this program. They were not asked how they liked it, because we felt that many of them would be disposed to be courteous and to say that they liked it, even if they did not. The figures follow:

No. of homes at which nurses called	564	
Homes without radio	133	(23.6%)
Homes with radio	431	(76.4%)
Homes in the habit of listening to Health Department program	186	(33.0%)
Homes not in the habit of listening to Health Department program	245	(67.0%)

If we apply these percentages to the entire city, we get the following figures:

Total number of homes	14,000
Number without radio	3,140
Number with radio	10,860
Homes with radio not getting our program	6,180
Homes with radio and getting our program	4,680

Discounting this last figure 50 per cent as a margin of safety we feel safe in estimating between 2,000 and 2,500 homes getting our message.

Of course, the latter part of this letter goes deeply into the realm of speculation but it is interesting and I know of no other way to estimate a radio audience. At least we are satisfied that our effort is worthwhile.

—W. W. Bauer, M.D., Commissioner of Health.

International Hygiene Exposition—Happily Dresden will continue its great health show through the summer of 1931. Further information may be secured through Dr. Rudolph Woerner, Room 835, 1775 Broadway, New York.

Readers of this department who visit Dresden may secure capable guide-interpreters at low cost. The editor will be glad to supply letters of introduction to staff members of the German Hygiene Museum, which is the central and permanent feature of the Exposition.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

Will They Do It?—What about the men or the women or the youngsters whom you expect to read your printing—will they do it?

> Yes, if you compel them to. The only way in which you can compel them is through the first impression they form the minute they receive your printed matter . . . call it attention-value, or what you will, you willingly admit that first impressions come through appearance. . . . Appeal to the eye in any form of sales promotion, is always a matter of printing, for modern printing is a great deal more than type, paper, and ink. . . . It is design, colors, size, style, the right type, and the right paper. It is possessing sound knowledge of how to print so it will be read and applying that knowledge to production. . . . Will they do it?

—From house organ of Speaker-Hines Printing Co., Detroit.

A Mother's Library—Do department stores in your city distribute or loan publications on the care of infants? This idea is fostered by *Infants' and Children's Department* (1 E. 35th St., New York), which says (May, 1931):

> A reference library for mothers is a tremendous potential factor in the building of business in infants' departments. The early departments for the most part felt that the loaning of books to mothers was an essential part of education. They found that it helped the department materially. They knew that infant welfare is largely a matter of education; and that the store which does the best job of educating stands the best chance of getting the business. Today, the idea of service is not so much emphasized. Certain outstanding books for mothers on motherhood and babyhood are available to stores for loaning purposes. Lending these books to mothers, without charge, tends to build in a mother's mind the belief that the store has her welfare at heart. The outlay for the books is small; the good accomplished by the loaning is great. . . . Lending a book is indeed a small gesture, but one that mothers accept gratefully. Most of them do not know what to ask for or where to look for it, even if they desire to have all possible information on subjects which so vitally concern them.

This points to another example of the many worthwhile jobs which usually cannot be touched for lack of time. *But it is a job for volunteers.* The out of date or definitely undesirable may now be used in some stores. Other stores might become interested in the idea and have a welcome for suggestions. Sales people in specialty and department stores having infants' and children's departments hear much about the problems of mothers. It is important that they know good publications to mention, and have good material to distribute when they undertake this service.

A tactful committee of one, two or three women could be enlisted by the health department or association to check up on what is now in use and refer lists to a competent authority for comment. The committee might go armed with copies of a small, selected list of books, pamphlets and magazines.

The page from a copy of the magazine mentioned above might be desirable. It is *free.*

"To Have and To Hold"—Under this title (*Survey,* 112 East 19th St., New York, May 15, 1931. *30 cents*), Arthur Dunham tells how to handle one's personal collection of professional reference material—"notes, memoranda, manuscripts, clippings, reports." The 5 steps outlined apply equally well to the office collection of the public health worker who has no elaborated filing classification—and to the health education worker until that time when we have a topical classification on either school or public health education.

Suppose we start with cutting up the *Journal*—all the articles containing references to health education and all of the topics appearing under "Education and Publicity." We will want to subscribe for an additional copy of the *Journal* or beg the "Education and Publicity" pages from a coworker to have both sides of the pages.

Requested: the classifications used by some of our collectors of health and health education information.

Not **Among Those Present**—Schools of Law, Schools of Medicine, Schools of Veterinary Medicine, Schools of Osteopathy, and others are listed but—as is the custom—schools of public health are not listed in Institutions of Higher Education, an official publication of Office of Education, Dept. of the Interior. Page Prof. C. E. Turner!

CHILDREN AND SCHOOLS

"The Nurse in the High School," by A. G. Ireland, M.D. (includes health education); "The Health Counsellor in High School," by C. M. Simon, R.N. *Public Health Nurse,* 450 7th Ave., New York. Oct., 1930.

"A Puppet Show," by C. A. Hammond. *Hygeia.* June, 1931. Details and "The Health Brownies Help" in full—as given by school children. Puppets are good for all ages.

"Summer Health Schools" (in Los Angeles County) by Alma Overholt. *Hygeia.* June, 1931. 6 illus.

"Teaching Housing to School Children," by Bleecker Marquette. What an 8th-grade course aims to do. *Journal of Home Economics,* Baltimore. June, 1931. *30 cents.*

"Teaching Topics on Narcotics." *Journal of Natl. Education Assn.,* Washington. Feb., 1931. Reprint. *10 cents.*

"What Can the Volunteer Agency Do to Assist State Departments of Education to Obtain Adequate Supervision of Health Teaching?" by J. E. Rogers. 8 pp. Reprint. Natl. Tb. Assn., 450 7th Ave., New York. *Free.*

School Hygiene Handbook—Division of Child Hygiene, Massachusetts Dept. of Public Health. 95 pp. A working manual—crammed full of detailed procedures, blank forms, condensed facts—numerous addresses given in full—index and *date!* The good outline of publicity is so condensed that it lacks the detail for easy use by those more familiar with procedures in other directions. As it happens no information source is mentioned. Does not the Child Hygiene Division supply ideas or forms for some of the suggested publicity material?

EDUCATIONAL MATERIAL

Cause and Prevention of Typhoid Fever. Tennessee State Dept. of Health. 14 pp.

Coming Home from the Sanatorium—4-page folder for patient, family and friends. Natl. Tb. Assn., 450 7th Ave., New York.

What You Should Know About Tuberculosis—a 32-page pamphlet for tuberculosis patients. Natl. Tb. Assn.

Hazards of Commercial Health Advertisements, by Iago Galdston, M.D. Reprint from *Journal.* Author: 2 E. 103d St., New York. *Free.*

Exercises for Constipation. 4 pp. Setting Up Exercises. 4 pp. *Farmer's Wife,* St. Paul. *Free.* Get copies for the illustrations.

Posture and Physical Fitness. 45 pp. (Children's Bureau.) Supt. of Documents, Washington. *10 cents.*

Production of Clean Milk. Revised. 18 pp. (Agriculture Dept.) Supt. of Documents, Washington. *5 cents.*

Twenty Live Reasons for First Aid Training—describing successful first-aid cases. 8 pp. U. S. Bureau of Mines, Washington. *Free.*

Safety Consciousness—necessity of developing safety consciousness in industry. 6 pp. U. S. Bureau of Mines. *Free.*

The Paramount Issue—importance of educating public opinion on accident prevention. 7 pp. U. S. Bureau of Mines. *Free.*

A Survey of the Medical Facilities of the City of Philadelphia, by Sinai and Mills. 28 pp. A Study of Physicians

and Dentists in Detroit, by Sinai and Mills. 50 pp. The "Municipal Doctor" System in Rural Saskatchewan, by Rorem. 20 pp. Committee on the Costs of Medical Care, 910 17th St., N.W., Washington. *Free.*

Foods and Cooking—list of publications for sale by Superintendent of Documents, Washington. *Free.*

NEW

Review and Information Bulletin, League of Red Cross Societies, 2, Avenue Velasquez, Paris. This supersedes *World's Health.* Much news of public health and public health education activities from 57 countries. *25 cents; $2.00 a year.*

Almost a year old, but new to this department is *School Physicians' Bulletin,* Am. Assn. of School Physicians, State Education Bldg., Albany, N. Y.

The Health Examiner, Greater New York Committee on Health Examination, 2 E. 103d St., New York. Distributed to all practitioners in Greater New York as a feature of a 5-year campaign sponsored by the 5 county medical societies. Edited by Iago Galdston, M.D. Most of the contents useful in other cities. Free to health officials.

HONORABLE MENTION

To Department of Health, New Brunswick, Canada: for annual report with detailed table of contents.

To Quebec Provincial Bureau of Health: for yearly table of contents (two languages) of *Bulletin Sanitaire.*

CAMPAIGNS

"Doctors Here Open Health Test Drive—County Societies Join in Five-Year Campaign for Preventive Examinations—To Use Films and Radio—Welfare and Civic Groups Will Be Asked to Coöperate in Program of Public Education"—thus the *New York Times.* April 26, 1931. The Greater New York Health Examination Committee is located with the Academy of Medicine, 2 E. 103d St., New York.

A 3-months campaign in education on syphilis and gonorrhea is reported in An Educational Experiment in the Bellevue-Yorkville District of New York City, by Savel Zimand. A reprint from *Journal of Social Hygiene* (March, 1931) will be supplied by the author at 325 E. 38th St., New York, who says:

> Ours was merely an experiment—a beginning. We have learned a great deal from it. We hope it will be taken up by others.

Empire Health Week is reported in *Mother and Child,* London, as having been celebrated from Bath to Bagdad. Started in the United Kingdom in 1912 it has spread to Australia, New Zealand, India, Africa, Canada, and elsewhere.

Glimpses of Roll Call campaign ideas were given in *Red Cross Courier,* Washington, for Oct. 15, 1930. "The Diary of a Roll Call Chairman" brings Mr. Pepys down to date in the guise of a 1930 Red Cross chairman. Clever and stimulating.

If you have a malaria campaign ahead you will wish to look up the illustrations for "Mosquito Propagation" in *Municipal Sanitation,* 24 West 40th St., New York, Jan., 1931. *15 cents.*

CONVENTIONS

School or popular health education topics are being found on many convention programs. Some recent examples:

"The Health Education Service of the Department," by Mary Power—Ontario Health Officers' Assn.

"Aids in Child Health Education," by T. J. Werle, Michigan Tb. Assn.—Illinois Tb. Assn.

"Health Education," by Saidie Orr-Dunbar, Ira V. Hiscock, H. J. Sears, Catherine S. Bastian, Arlien Johnson—Western Branch of A. P. H. A.

"Publicity in Health Education," by A. E. Wells, Manitoba Dept. of Health and Public Welfare—Canadian Public Health Assn.

"The task of national Red Cross So-

cieties in organizing and conducting campaigns to protect communities against tuberculosis, etc."—Third Pan-American Red Cross Conference.

The Connecticut, Rhode Island and Massachusetts Societies for Mental Hygiene sponsored a New England Conference on Mental Hygiene in Education, May 1 and 2, 1931.

The recent first conference of state mental hygiene societies in New York devoted one afternoon to educational and publicity topics.

The chief meeting of the season on school health education will be the section on this subject in the World Federation of Education Assns., Denver, July 27–Aug. 2. Address: Sally Lucas Jean, 200 5th Ave., New York.

If you have failed to see the folder, Why I Attend Annual Meetings, be sure to ask the A. P. H. A. for a copy.

DIPHTHERIA

Pau Diphtheria, Board of Health, Hawaii, is "the story of Honolulu's campaign." An insert "For Mainland Readers" interprets the title: "Put an end to Diphtheria"! And the report tells how nearly that was done by the use of 8 languages and many activities.

"New York City's Diphtheria Campaign," by E. F. Brown. *Quarterly Bulletin*, Milbank Memorial Fund, 49 Wall St., New York. Jan., 1931. *Free.* Review of the N. Y. City campaign.

Mass movements are necessary in the early stages of any new idea. Very few of us do any of the things we do by sheer force of intellect. Many of us know that we eat far too much and that two meals a day would be much better for us than three; however, when everyone else is going to the dinner table it creates a situation that makes even the most obese conspicuous unless he likewise gathers around the festive board. The same might be said of the styles in women's and men's clothing. We wear furs about our necks in July and go with our necks bare in January not for any real intellectual reason but because those in the orbit in which we wish to appear are doing it. Need I go further with illustrations of the sheep-mindedness of the human race? The street ballad "Everybody's doing it" is about as good a reason as most of us can give for many of the things we do.

As public health workers we should take advantage of this characteristic of the human mind and utilize this tendency to move *en masse* in the promotion of a sound public health program. To test out the importance of utilizing the mass movement in diphtheria prevention work, a former state health commissioner in Ohio set aside two counties for an experiment. He had the counties canvassed by lecturers, and public health nurses, distributed printed matter as near as possible, and carried on a modern diphtheria prevention campaign except that instead of utilizing the mass movement of the community, parents were *told* to take their children to the family physicians to have them immunized. Diphtheria immunization in these two counties was to be a single and individual service of the physician to the patient, without the element of mass movement being involved. At the end of a year of this type of work, careful surveys were made of the entire county which showed conclusively that slightly less than 2 per cent of the children were immunized. In the adjacent counties where the same methods were used and the impetus of mass movement in public health was tried, 95 per cent and 98 per cent of the average daily attendance at the schools were found to be immunized. Could a better picture of the importance of mass movement in public health work be required? When a piece of public health work is absolutely new, and the idea is falling on untilled soil, perhaps a campaign is the proper way to approach the problem.

—D. M. Griswold, M.D., in *Illinois Health Quarterly*, State Dept. of Public Health. January–March, 1931. Next month we will quote further from Dr. Griswold—some questionings as to campaigns.

RADIO

Every health and social agency using the radio should study "Advertising by Radio" by Orrin E. Dunlap, Jr., radio editor of the *New York Times* (Ronald Press, New York. 186 pages. $4.00). There is no direct instruction for the health or social worker, but numerous

indirect suggestions and much valuable information. Note this: "Simplicity is what counts. . . . The radio audience care nothing for 'hifalutin' words. Talk in language everyone can understand." Check this advice with some of the selections from radio health talks which have been quoted under "Words" in this department.

Devils, Drugs and Doctors, weekly radio talks by H. W. Haggard, M.D., are supplied upon request in perforated loose-leaf form, by Eastman Kodak Co., Rochester, N. Y. Why are so many thousands of hearers so interested that they write for copies of these broadcasts?

He who plans a local series of broadcasts (or brief newspaper releases) on health superstitions will find useful material in *Hygeia*, including "Ghosts and Gods, Astrologers and Miracle Men," by Otto Neustätter. June, 1931. Illustrations from International Hygiene Exposition.

A radio course in mental hygiene is based on a series of 8 broadcasts by Dr. H. B. Elkind, Massachusetts Society for Mental Hygiene. Radio audience students register by sending $1 to State Division of University Extension, State House, Boston. They receive printed information on which each lecture is based and instructions for required home work.

"A Revealing Smile" (5 minutes on mouth hygiene). *Connecticut Health Bulletin*, Hartford, Jan., 1931.

"Getting Along With People"; "Those Human Spark Plugs"—Connecticut State Dept. of Health.

"The Great Unknown" (mental hygiene); "A Legend of the Great East Gate" (germs); "Measles Is a Dangerous Disease"—New York State Dept. of Health.

"The Mechanics of Smell"; "What People Believe"; "Man's Marvelous Machinery"—broadcasts by American Medical Assn.

"Fatigue and Worry"; "Fatigue and the Blues"—Public Charities Assn. of Pennsylvania, Philadelphia.

"Some Fundamental Principles of Child Training" is a radio topic announced by a health agency. *Will someone re-write the title so that parents will be inclined to tune in?*

One wonders who tuned in on a recent radio talk on "Hygienic Adjustment Throughout Life"?

Debates, speakers, music, comment on current problems, and answers to questions from the radio audience make up the weekly program of the very successful radio Community Forum of the St. Louis Community Chest. To be studied by a group of health agencies, or health and social agencies ready to invest generously in brains and time. Annual report *free*.

Much information about education in general by radio is available upon request to Office of Education, Washington, D. C., and National Committee on Education by Radio, 1201 16th St., N.W., Washington, D. C.

Illinois Society for Mental Hygiene broadcasts through Station WMAQ, Monday, 5:45 p.m., C. S. T.

Minnesota State Medical Assn. broadcasts over WCCO, Wednesday, 11:45 a.m.

MAGAZINE ARTICLES

"The Family Doctor," by Dr. Winford H. Smith. *Saturday Evening Post*. May 16, 1931. The complicated cost of medical care.

"How to Pick a Doctor," by C. Houston Goudiss. *Literary Digest*. May 30, 1931. From *The Forecast*, New York. Well worth looking up.

"The Right to Drive," by R. S. Kirby. *Atlantic*. April, 1931. Automobile accidents largely due to lack of concentration, caution, consideration.

"The Slender Waist: How to Regain It," by Dr. G. F. Alsop. *Woman's Journal*, 171 Madison Ave., New York. March, 1931. Includes simple exercises.

BOOKS AND REPORTS

The Principles of Epidemiology and the Process of Infection—*By C. O. Stallybrass, M.D., D.P.H. New York: Macmillan,* 1931. 696 pp. Price, $8.50.

We have here an exceptionally good book, following in many respects new lines. While we cannot entirely agree with the definition of epidemiology given, we are not inclined to find serious fault with it, though it seems to have furnished the reason for burdening the text with some material which might have been better treated elsewhere.

Chapter III, of 47 pages, is devoted to statistical methods, the understanding of which is doubtless of value to every health officer, but which we believe has no place in a book of epidemiology. In a number of other places, statistical material is brought in, and Appendix I is a table for calculating probable error. Appendix II gives the classification of pathogenic bacteria and there is some discussion in the body of the book on bacteriological and mycological classification and nomenclature which it seems to us might well have been omitted. We are doubtful concerning the propriety of including the long discussion of specific resistance in which we find several of the leading theories of immunity, anaphylaxis, etc.

The greater portion of the book, which is devoted to what is really epidemiology, is unusually good and well put, and may be regarded as a series of masterly essays which show deep study and wide experience.

Without any desire to lessen the credit of Semmelweiss, we must point out the well known fact that the credit of having first called attention to the contagious nature of puerperal fever belongs to Oliver Wendell Holmes, who in 1843 wrote: "The disease known as Puerperal Fever is so far contagious as to be frequently carried from patient to patient by physicians and nurses."

There are some omissions such as that of the name of Agramonte from the United States Army Commission appointed to study yellow fever. A number of misprints of proper names also occur, as Desonbry for Desoubry, Lazcar for Lazear, and B.C.G. for BCG.

The book is primarily intended for the medical officer of health and is written from the English standpoint, though American and other foreign authors are fairly treated. In addition to his own extensive experience, the author has availed himself of the assistance of several noted bacteriologists and epidemiologists.

The book ends with a fairly good bibliography and index of authors, as well as a subject index. Altogether we consider it one of the best books for its purpose which has come to our attention. It is attractively written and well illustrated with charts, diagrams, and a few colored plates. M. P. RAVENEL

The Physical Basis of Personality—*By Charles R. Stockard. New York: W. W. Norton & Co., Inc.,* 1931. Price, $3.50.

This is A Scientific Book Club Selection, and may well be read in connection with *Biological Basis of Human Nature,* by Jennings. The two are similar in field and in treatment. In this book the ability of environment, especially prenatal, to modify what might be considered as normal development and thus alter in various ways different individuals of identical genetic heritage, is emphasized. It is the outcome of the series of Lane Medical Lectures given

by the author at Stanford University, in 1930, rewritten and rearranged, however, in order to adapt it to the more general reader.

The author has succeeded in this object as far as is possible. It is useless, however, to claim that the material in Chapters III and IV, for example, is easily understood unless one has had some groundwork in biology. The matters discussed have puzzled physiologists and psychologists, and there is not even now agreement on some important points.

The known facts are here clearly given and a recognition of them would avoid the errors indulged in by many who consider themselves trained scientists. The subjects of senility and rejuvenation are considered, and it is clearly shown that the sex gland rejuvenation idea is based on an entirely erroneous conception.

The author is a well known anatomist, and his statements carry the weight of authority. The volume can be commended to all interested in the subject, and perforce all must be whether they recognize it or not. The printing and make-up of the book are excellent, the illustrations abundant and good.

ALLEN E. STEARN

Noguchi—*By Gustav Eckstein. New York: Harper,* 1931. 418 pp. Price, $5.00.

This account of Noguchi and his work is written by a man who, according to his own account, was a dentist, studied medicine, and taught physiology, though he confesses that he "learned not much," but later "learned prodigiously" from making friends with two rats.

The book shows vivid imagination, and the jacket displays something of the same characteristics. The writer puts what he has to say in an interesting and often fascinating way. The style may be described as a succession of superlatives in staccato. Our objection to books of this type is that, being written for laymen who do not know the facts and are not able to analyze the statements made, wrong impressions of medical history are given.

It is perfectly true that Noguchi had quite a remarkable career. He was an indefatigable worker, did experiments on a grand scale, and undertook the solution of most difficult problems. His reputation will rest chiefly on his having been the first to cultivate artificially the germ of syphilis, and to demonstrate that this germ could be found in the brain matter of those suffering from general paralysis of the insane. The accuracy of much of his other work is extremely doubtful, and some of it known to be positively erroneous. His alleged discovery concerning the germ of yellow fever has been proved to be entirely wrong, and one cannot but regret that a man who had done so much that was good should have come to the end of his life under the shadow of such a mistake. It was a tragedy.

He overcame in a remarkable way the injury to his hand by a burn and his sensitiveness to the resulting deformity. It came near to causing his exclusion from the United States. The late Dr. J. J. Kinyoun of the U. S. Public Health Service was quarantine officer when he arrived, and hesitated a long time on this account before admitting him to the country.

The book is beautifully printed and illustrated.

M. P. RAVENEL

Silicosis. Records of the International Congress Held at Johannesburg, 13–27 August, 1930—*By The International Labour Office: Studies and Reports, Series F. (Industrial Hygiene) No. 13, Geneva, 1930. (World Peace Foundation, 40 Mt. Vernon St., Boston)* 694 pp. + 40 pp. of plates. Price (paper), $1.00.

This is a report of a congress of some

50 world experts on silicosis, about half of whom were listed as members, representing Australia, Canada, Germany, Great Britain, Italy, Netherlands, Union of South Africa, and the United States of America. The balance were designated as observers who were from South Africa and also took an active part.

While the International Labour Office has followed closely the developments in silicosis throughout the world it was especially at the suggestion of Dr. Orenstein and the invitation of South African authorities, both official and industrial, that the congress was called. Dr. G. L. Ervine (Chairman of the Miners' Phthisis Medical Bureau, Johannesburg) was elected chairman of the conference and Prof. G. Loriga, Italy, and Sir Spencer Lister, England, vice-chairmen. There were 13 sittings held during the conference, the reports of which comprise 103 pages of the report. These include the chairman's address by Dr. Ervine and oral and written discussions upon the subjects of occupational conditions and methods of dust prevention, preventive measures, etiology and pathology of silicosis, its diagnosis as an occupational disease, statistics, and a draft report on preventive measures and compensation. The familiar name of A. Mavrogordato occurs frequently in the hearings, but we miss that of Haldane, who, however, was in South Africa the year before at another conference on the same subject.

The balance of the report contains some 20 major papers presented by experts in Johnnnesburg, and 14 special papers by the representatives of the various other countries named. These papers deal with practically all phases of the subject from historical aspects to sanatorium treatment, compensation, and actuarial valuation. Many tables, diagrams, bibliographies, and numerous half-tones accompany. There is no index but a brief table of contents and a list of members and observers are given, as well as a verbatim copy of the entire transactions.

On page 562, Dr. Russell, of the U. S. Public Health Service, presents an interesting table of the industrial uses of silica and the types of silica used. An appendix on asbestos dusts is given by Dr. L. A. Garden and Dr. Donald E. Cummings of Saranac Lake.

The volume may well be considered as containing the last word in the world's knowledge of silicosis. It is printed in large type, very well edited and invaluable to those interested. It should dispose of the doubts which seem to exist in this country of the existence of silicosis as a disease entity and of the ability to compensate it fairly in view of the fact that the South African Bureau is now expending about a million pounds per year on the compensation features.

EMERY R. HAYHURST

William Henry Welch at Eighty—*Edited by Victor O. Freeburg. Published for the Committee on the Celebration of the Eightieth Birthday of Doctor William Henry Welch by the Milbank Memorial Fund, New York*, 1930. 230 pp., 14 pl.

For his fine courage and rare ability to pursue truth into its innermost fastness, his broad vision of scientific conquests for the practical benefit of humanity, his warm zeal for discovering and developing the strength of others crusading for health, his charming genius for friendship, and his modesty, marked as his greatness, Dr. William Henry Welch has long been the recipient of cumulating honors and felicitations. When he reached the age of 80, on April 8, 1930, it was but natural that the legions of his followers, colleagues, personal friends and admirers should pay their tributes more abundantly than ever before.

A selected group of the most distinguished men in science, literature, statesmanship and the affairs of business and

philanthropy arranged the celebration for Dr. Welch's 80th birthday. Exercises to commemorate the event were world-wide. At Washington the speakers were President Hoover, Livingston Farrand, Simon Flexner and John A. Kingsbury. The book contains their tributes as well as Dr. Welch's charming and impersonal reply. In addition to the ceremonies at Washington, like gatherings were held simultaneously at the New York Academy of Medicine, the London School of Hygiene and Tropical Medicine, the Pasteur Institute at Paris, the Peiping Union Medical College at Peiping, China, the Kitasato Institute at Tokyo, Japan, and many other centers of medical education. Accounts of these observances are also included.

Theobald Smith says that the attempt to describe in a few words the place which belongs to Dr. Welch must necessarily degenerate into gesture (page 46).

The frontispiece of Dr. Welch, a reproduction of an etching by Alfred Hutty, is both a speaking likeness and a distinguished work of art. The book is admirably printed, exceptionally well edited and has a good index.

M. J. ROSENAU

The Prevention of Disease in the Community—*By Curtis M. Hilliard. New York: McGraw-Hill*, 1931. 193 pp. Price, $1.75.

This small handbook is intended to give students a general idea of what is meant by public health. Students hear a great deal about personal health but often very little about health as it concerns a community as a whole or groups of persons in the community. This book is well adapted to give such general information. It is based on the scientific knowledge of disease and the most generally accepted methods for disease control.

It would probably have been more valuable if there were more references to the sources from which information was drawn and a short bibliography outlined for those who might wish to get a more extended knowledge of the subjects treated.

The text has not been carefully edited, as there are a number of examples of inexactness of expression and of omissions. The table on page 159 does not state that the figures are per 100,000 population; on page 168 a table is called a diagram. It is barely correct to call toadstools (page 118) a food, or to suggest, as on page 120, that "such infectious origins should be discovered and condemned before the products can be used for food." They should be condemned to prevent their being used as food. Again, it is not fair to leave the impression, as on page 177, that the U. S. Public Health Service has been the only or always the main agency in getting the over 500 county health departments established in the United States. In some states this has been done by the state itself and in some counties by the county itself, in others by some of the agencies mentioned on page 188 or by other agencies. The U. S. Public Health Service has been, and at present is, especially active in stimulating states and counties to adopt the plan, but that Service is far from claiming the credit for all that has been done along that line.

There are a few places where the form of expression could be improved, as on pages 14 and 71, but outside of a few minor defects, easily corrected, the book is an interesting and instructive presentation of the subject.

JAMES WALLACE

Report of the Westchester County Sanitary Sewer Commission—*November 20, 1929, to December 31, 1930.*

Several records are claimed in the 1930 report of the Westchester County Sanitary Sewer Commission. One of these is the longest submarine sewer out-

fall, which is 2.42 miles long, 54" in diameter, and discharges into 51' of salt water on the Mamaroneck Valley project. Another is the longest sewer tunnel, extending over 5 miles under Mount Vernon and conveying sewage from Hutchinson Valley to the Hudson River. Still another is the largest self-contained sewage sterilization plant under one roof. This is the joint sewage treatment plant at Yonkers, where the following process is in effect:

1. Preliminary sedimentation with coarse screening
2. Fine screening with dewatering and incineration
3. Effluent disinfection with chlorine under laboratory control
4. Remote submarine discharge with deep salt water dilution

By the coming summer all pollution will be eliminated from the shore of Long Island Sound in Westchester County and the first steps taken to eliminate similar pollution of the Hudson, at Yonkers.

At the close of 1930 appropriations of $23,670,925 had been received. A little over half has been spent. The largest single contract was for $985,000 for the North Yonkers Tunnel. Much work had to be done by divers, and quicksand offered serious obstacles.

L. M. FISHER

Der Mensch. Vom Werden, Wesen und Wirken des menschlichen Organismus. ***Herausgegeben vom Deutschen Hygiene-Museum, Schriftleitung: Dr. med. Martin Vogel, Wissenschaftlicher Direktor. Leipzig: Johann Ambrosius Barth,*** 1930. 420 pp. Price, 47 marks.

One of the most interesting developments in the public health movement in Europe was the International Hygiene Exposition held last year in Dresden. It resulted in the permanent establishment of the Hygiene Museum. A book has recently been published which embodies and illustrates much of the material which is on exhibition in the museum. There are 65 colored plates and over 300 other beautiful illustrations.

The first part of the volume deals with the structure of the cells and the tissues of the human body and with the functioning of the different organs. The second part sketches briefly the history of life upon the earth and traces the development of man from prehistoric times. The book is not a textbook but is written in a simple manner, utilizing the collections of the museum to arouse the interest of people and to teach them the important facts which they should know about the anatomy and physiology of their bodies. One of the most useful purposes of the book, however, is to bring to those of us who were not fortunate enough to visit the Dresden exposition an idea of what was accomplished there. It is a book that should prove of value to all public health workers.

DR. FELIX TIETZE, VIENNA

Proceedings of Eighth Annual Short School, Texas Association of Sanitarians, Amarillo, Texas, August 26, 27, 28, 1930.

The proceedings of this year's Texas Association of Sanitarians is divided into 5 major parts—waste disposal, water supplies, milk sanitation, epidemiological and laboratory studies, and miscellaneous public health problems.

In the waste disposal section a number of papers on garbage, refuse and trash collection and disposal are included. Sewage as related to irrigation is also touched upon.

Laboratory control of water supplies and the operation of swimming pools are subjects of two principal papers in the section on water supplies.

The important question of milk sanitation receives the attention of a number of writers who cover the operation of the standard milk ordinance in Okla-

homa, chemical sterilization of dairy equipment, and utensils, certain milk tests and discussions of certified milk, and dairy barn and milk house construction.

The remaining two sections of the transactions cover a miscellaneous group of papers, some of which refer to epidemiological investigations and others to health education, nursing, mosquito eradication and rodent control.

ARTHUR P. MILLER

Handbook of Protozoölogy—*By R. R. Kudo. Springfield: C. C. Thomas,* 1931. 451 pp., 175 ills., 1463 figs. Price, $5.50.

This handbook differs from others in its field in being primarily a systematic résumé of this large group of animals. It is also characterized by its wealth of illustrations of representative, significant, and interesting species. The illustrations, though of necessity simplified, are uniformly of excellent quality both in the technic of drawing and in the quality of the reproduction and printing. Magnifications are always given and related forms grouped for comparison. This wealth of illustration and the wide range of material included give to Dr. Kudo's book a uniquely useful place both for laboratory instruction and as a work of reference.

C. A. KOFOID

Jamaica Health Stories and Plays—*By B. E. Washburn, M.A., M.D., Rockefeller Foundation. Printed and Published by the Government Printing Office,* 1929. 110 pp. Price, $1.00.

This is a collection of health stories and plays, the former printed in the *Jamaica Public Health* through several years; the latter given in the schools of the colony during the year of 1927–1928. While local interest is chiefly kept in mind and the material is, therefore, specifically applicable to meeting demands in Jamaica, the book offers much of value to any instructor who aims to arouse a live attitude toward disease prevention and personal hygiene among students of younger age.

LENNA L. MEANES

Elements of Water Bacteriology with Special Reference to Sanitary Water Analysis—*By Samuel C. Prescott and Charles-Edward A. Winslow. (5th ed., rev.) New York: Wiley,* 1931. 219 pp. Price, $2.50.

This book, which has now reached its fifth edition, has been a laboratory essential for more than 20 years. This new edition maintains the standards set by the preceding ones, and doubtless the work will continue to hold the position so deservedly won.

The chief changes are to be found in Chapter V, which is devoted to the colon group, its classification and methods of isolation. We wish a fuller discussion of the Dominick-Lauter medium had been given. The method described by Dr. A. J. Salle, which had not been published when the manuscript was prepared, has been accepted at its face value, though the text gives no evidence that it has undergone the criticism of other workers. According to the authors, it "appears to show a marked superiority" over that given in *Standard Methods* of the American Public Health Association.

The printing and make-up of the book are excellent.

M. P. RAVENEL

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Tennessee—The biennial report of the State Department of Public Health for the period ending June 30, 1929, occupies 154 pages of carefully prepared information, well printed. Infant mortality rates of 72.2 and 77.6 are noted for the years 1927 and 1928. An outbreak of influenza at the close of 1928 was the only important epidemic for the biennium. The number of cases and deaths from typhoid showed a notable decrease, as did most of the other communicable diseases. Tuberculosis remains an important problem, with a rate of 134. An annual per capita expenditure of $.103 by the Department of Health in 1928 is compared with an average for 12 southern states of $.136. Special efforts are described to secure the coördination of administrative affairs and the development of new programs and proper relationships with other agencies, including the medical profession.

Through the Division of Administration, a study is routinely made of the relationship of all new work to the program as a whole. Periodic studies are made as to the effectiveness of the various health projects of the department. Through conference and current reports, duplication of effort on the one hand, and program gaps on the other, have been avoided.

Success continues in the development of local health service.

> Being entirely in line with the principles of democratic government which demand local responsibility and privilege, the county and city health departments have increased in efficiency and a greater number of citizens are each year being brought under the influence of reasonably adequate local health service. . . . In general, then, it may be said that the provision of local health service has proved itself sound and the outlook for continued and wider service is especially good in those counties containing at least $10,000,000 assessed valuation. In the smaller and not so wealthy counties, the problem remains difficult of solution. For instance, in a county with only some 3½ millions of taxable wealth, a tax rate of a little more than $.14 on the $100 would be necessary to produce one-half of a minimum budget. As most of such counties are already struggling under relatively high tax rates, their ability to increase the county's income in order to provide for health service is definitely limited. To meet this situation, temporarily, the department has tried two plans: (1) Furnishing service only along special lines, as sanitation, public health nursing; and (2) by combining two or more counties into health department districts.

The report is well illustrated with excellent graphs, photographs and statistical tables. The general objective of the state health education program is to carry to the people of the state, both directly and indirectly, understandable information as to the fundamentals of health protection and disease control so that this knowledge may become usable as an integral, habitual part of daily life; and further to give sound information on public health problems and procedure, to the end that each county may provide its citizens with adequate health service. The program includes teacher training, health lectures in classrooms, classes in home hygiene, a public information service, personnel training, and consultant service.

New Brunswick, Canada—The construction of a new laboratory in conjunction with the new general hospital of Saint John is one of the outstanding events of the year, mentioned in the 1930 report of the Chief Medical Officer to the Minister of Health. Active immunization campaigns have been conducted in various districts resulting in the protection of some 35,000 children under the auspices of the Department of Health.

Efforts of travelling clinics are credited with much of the success in reducing tuberculosis mortality in the area to 84. Besides the diagnostic work associated with these clinics, efforts have been made to further health instruction. Over 54,300 school children were also given medical examinations and some 10,000 were vaccinated against smallpox. "Smallpox continues practically not to exist with us."

A birth rate of 24.4 and a general death rate of 12.5 are recorded.

Hawaii—The Territory of Hawaii, with a 1930 population of 370,620, records in the annual report of the Board of Health a birth rate of 29.6 and a death rate of 10.8. The infant mortality was 87.4 as compared with 101.7 in 1929, decrease for all races being noted except among the Portuguese and Hawaiians.

The control of tuberculosis is recognized as a health problem of first importance. Hence the director devoted considerable time to educational activities. A pamphlet, *What You Should Know About Tuberculosis,* was published in English, Japanese, and Filipino languages and widely distributed. The focus of publicity through the press was turned upon childhood tuberculosis. A new film was shown in the schools and before parent-teacher groups. Pamphlets and posters in schools, libraries, the Y. W. C. A., and in street cars were utilized. Special courses and lectures were given to nurses, physicians, and lay groups. On July 1, 1930, there were 2,325 active cases on the register, while 392 deaths occurred during the year, a decrease of 15 over the previous year. The problem is carefully analyzed in the report. A school survey was undertaken with the aid of funds from the American Association of University Women, in cooperation with the Boards of Education and Health. This work included tuberculin tests and X-ray examinations (1,189). Through the coöperation of official and voluntary agencies, a preventorium was opened.

In the public health nursing field, generalized nursing was adopted in Honolulu through the pooling of nurses of the Board of Health and Palama Settlement; additional nurses, including supervisors, were added; prenatal clinics were opened on the island of Kauai, and improvements were made in the methods of health examination of school children. This is an excellent report of progress containing many valuable statistical tables, charts and photographs, with interesting descriptive text.

Newton, Mass.—In the 1930 report, a death rate of 8.3, the lowest in history, is recorded. This figure is based on a population of 65,763. A classified financial statement indicates an expenditure by the Health Department of $.57 per capita. There were only 3 cases of diphtheria reported, with no deaths. Immunization work was continued. There were 80 cases of scarlet fever reported, with no deaths. The difficulty of detecting mild cases in the early stages of this disease is emphasized.

Physical examinations of school children revealed 5.7 per cent in all public schools to have physical defects as compared with 9 per cent among junior high school pupils. An infant mortality rate of 29.9 for the year is noteworthy.

Arizona—In 1930, through the aid of funds from the U. S. Public Health Service, a state-wide immunization campaign was organized which resulted in 38,904 diphtheria immunizations, 16,443 smallpox vaccinations, and 12,307 typhoid inoculations. Six schools were immunized 100 per cent against three diseases, and several others to the extent of 98 per cent.

During the year, the new State Building was completed, in which quarters were provided for the State Board of

Health on the first floor. A coöperative laboratory unit was established with the city of Phoenix and Maricopa County and the State Dairy Commissioner. In November the State Board of Health maintained an exhibit booth at the State Fair in collaboration with the State Medical Association. Approximately 50,000 pieces of health literature were distributed during the week.

Commonwealth Fund—New developments in the field of public health, with effort particularly devoted to the building up of better health service for rural communities, are described in the twelfth annual report of the Commonwealth Fund. Coöperative arrangements have been established during the year with the state health departments of Tennessee and Massachusetts whereby in each of these states intensive work has been undertaken in two rural districts, and special provision has been made for the training of rural physicians. The selection of other states for similar coöperative effort is pending. According to the report:

> It is the interplay between public health and the private practice of medicine that gives the new health program its distinctive character. The problem of the typical rural community is to make use, more deliberately and more wisely, of all the available resources for the promotion of health and the cure of disease. The rural physician has usually defended his patients single-handed against illness and premature death. He must always carry the major responsibility, but he need not stand alone, and if he can get a firm grasp of modern medical technique, he may be able to move forward from his defensive position and lead an aggressive attack on disease.

Under the program initiated by the Fund, the local health authorities in each of the selected rural districts will be aided to develop their service to the point of greatest usefulness within the limits of sound budgeting, on the understanding that all expenses, during the introductory period, will be shared between the county, the state, and the Fund.

In each state, 15 scholarships will be provided annually for rural physicians, 5 in each of the special districts and 5 in the state at large. The medical school chiefly responsible for the training of rural physicians in each of these states will be helped to develop its teaching of preventive medicine and its facilities for postgraduate training. Scholarships or loan funds will be provided for undergraduate students of medicine who agree to go into rural practice. Scholarships for postgraduate nursing study will also be offered.

The new program follows and supplements work which the Fund has been doing for some years in the field of child health and in the establishment of rural hospitals, 6 of which have now been built through the assistance rendered to various communities. In fact, the plan for scholarships whereby local practitioners might return to medical schools for postgraduate work was started in connection with the rural hospital program, and from the 6 communities, 82 local physicians have been given the opportunity for such study.

The appropriations made by the Fund during the year totalled $2,095,918, covering a wide range of activities mainly in the fields of public health, mental hygiene, and British-American relations. In the field of mental hygiene, the report covers the first year's work of the Child Guidance Clinic, established in London in accordance with plans formulated by the Child Guidance Council. The Council, organized by the Fund, serves the whole of Great Britain; it gives advisory service to those interested in forming new child guidance clinics and coöperates with the London School of Economics and Political Science in its training school for social workers.

Continued support has been given to

the Institute for Child Guidance established by the Fund in New York primarily to meet the great need for a larger number of well trained personnel in this field.

The efforts of the Legal Research Committee have continued to center upon projects in administrative law, including studies of the Interstate Commerce Commission, workmen's compensation laws, and the administrative powers and methods of the Department of Agriculture. Another study made under the direction of the University of Chicago Law School, and dealing with insanity as a defense in criminal law, is approaching completion. Special grants were given to 41 outside organizations, hospitals and universities for various projects. These included many research undertakings in the field of preventive medicine.

BOOKS RECEIVED

RESISTANCE TO INFECTIOUS DISEASES. 4th ed. By Hans Zinsser. New York: Macmillan, 1931. 651 pp. Price, $7.00.

PRINCIPLES OF CITY PLANNING. By Karl B. Lohmann. New York: McGraw-Hill, 1931. 395 pp. Price, $4.00.

THE TREATMENT OF BEHAVIOR DISORDERS FOLLOWING ENCEPHALITIS. By Earl D. Bond and Kenneth E. Appel. New York: Commonwealth Fund, 1931. 163 pp. Price, $1.75.

THE PSYCHOLOGY OF INSANITY. 4th ed. By Bernard Hart. New York: Macmillan, 1931. 191 pp. Price, $1.25.

EYE, EAR, NOSE AND THROAT FOR NURSES. By Jay G. Roberts. Philadelphia: Davis, 1931. 213 pp. Price, $2.25.

THE FAMILY IN THE PRESENT SOCIAL ORDER. By Ruth Lindquist. Chapel Hill: University of North Carolina, 1931. 241 pp. Price, $2.50.

CHEMISTRY FOR NURSES. By Harry C. Biddle. Philadelphia: Davis, 1931. 336 pp. Price, $2.75.

EASIER MOTHERHOOD. By Constance L. Todd. New York: John Day, 1931. 199 pp. Price, $2.00.

THE SIGNIFICANCE OF WATERBORNE TYPHOID FEVER OUTBREAKS, 1920–1930. By Abel Wolman and A. E. Gorman. Baltimore: Williams and Wilkins, 1931. 82 pp. Price, $2.00.

MY HEALTH HABITS. By Charlotte Townsend Whitcomb, John H. Beveridge and Evelyn Estelle Townsend. New York: Rand McNally, 1930. Book II. 200 pp. Price, $.88. Book III. 238 pp. Price, $.96.

DIABETES AND ITS TREATMENT BY INSULIN AND DIET. 5th ed. By Orlando H. Petty. Philadelphia: Davis, 1931. 231 pp. Price, $2.00.

MILITARY PREVENTIVE MEDICINE. By George C. Dunham. 2d ed. Carlisle Barracks: Medical Field Service School. 1062 pp.

POPULATION PROBLEMS. By Warren S. Thompson. New York: McGraw-Hill, 1930. 462 pp. Price, $3.75.

THE COMMUNITY AND SOCIAL WELFARE. A Study in Community Organization. By Cecil Clare North. New York: McGraw-Hill, 1931. Price, $3.50.

HEALTH STORIES AND PRACTICE. By William E. Burkard, Raymond L. Chambers and Frederick W. Maroney. New York: Lyons and Carnahan, 1931. 256 pp. Price, $.76.

PRINCIPLES AND PRACTICES IN HEALTH EDUCATION. From the Sixth Health Education Conference, Sayville, Long Island, June 16–21, 1930. New York: American Child Health Association, 1931. 485 pp. Price, $1.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Diphtheria Mortality Rates—The annual tabulation of diphtheria death rates for large cities reveals the lowest rate ever recorded, about half that of 5 years ago. Whether this is due to the general use of toxoid and toxin-antitoxin or to a decrease in general susceptibility remains to be proved. But the figures encourage the extension of the prophylactic program.

ANON. Diphtheria Mortality in Large Cities of the United States in 1930. J. A. M. A., 96, 21: 1768 (May 23), 1931.

Typhoid Fever Mortality—The annual compilation of typhoid fever mortality rates for the large cities of the country in 1930 shows the usual interesting statistics. The rate for the entire country is the same as that for 1929.

ANON. Typhoid in the Large Cities in the United States in 1930. J. A. M. A., 96, 19: 1576 (May 9), 1931.

Physical Defects and Sex—Rates of physical impairment are higher for women than for men, notably so in respect to thyroid conditions, visceroptosis, edema, adenitis, varicosities, heart conditions, tuberculosis, etc. The rates for men were greater in the case of urine casts, defected septum and arterial thickening.

BRITTEN, R. H. Sex Differences in the Physical Impairments of Adult Life. A Comparison of Rates among Men and Women Based on 112,618 Medical Examinations by the Life Extension Institute. Am. J. Hyg., 13, 3: 741 (May), 1931.

About Leprosy—A non-technical discussion of leprosy and control measures.

FORD, W. W. Leprosy in the United States. Sci. Monthly, 32, 6: 513 (June), 1931.

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GAFAFER, W. M. Upper Respiratory Disease (Common Cold) and the Weather. Baltimore, 1928–1930. Am. J. Hyg., 13, 3: 771 (May), 1931.

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GIBLIN, J., and VON POURTALES, J. H. Dried Powdered Milk Preparations Used in the Feeding of Infants. Am. J. Dis. Child., 41, 5: 1100 (May), 1931.

Preschool Health Education—How constructive are health songs, plays and pageants? This paper answers the question so far as preschool ages are concerned.

HARLEY, W. Health Education for Preschool Children. Pub. Health Nurse, 23, 5: 213 (May), 1931.

Urinalyses and Health—The limitations of the urinalysis as a health index as well as its place in health diagnosis are both covered in this brief paper.

KILDUFFE, R. A. Urinalysis as an Index of Health. Am. J. Nurs., 31, 5: 563 (May), 1931.

The Laborer is Worthy of His Hire—Physicians in public health receive the lowest average income of any in a salary survey of a large medical

group. However, the health official's salary, which is net, is compared with the gross income of private practitioners the median of which is $6,500–$7,500.

LELAND, R. G. Income from Medical Practice. J. A. M. A., 96, 20: 1683 (May 16), 1931.

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MOORE, H. H. Progress during 1930 in Medicine and Public Health. New England J. Med., 204, 19: 994 (May 7), 1931.

A City's Health Progress—Originally surveyed in 1923, resurveyed twice since to establish progress along lines laid down, Knoxville was given another going over to estimate achievement as originally projected and to help arrive at a continuing program. A record for periodic health examinations, it would seem.

MOUNTIN, J. W. Public Health Progress in Knoxville, Tenn. Pub. Health Rep., 46, 20: 1150 (May 15), 1931.

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MCKAY, A. L., *et al.* A Septic Sore Throat Epidemic. Canad. Pub. H. J., 22, 5: 224 (May), 1931.

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ROBERTS, F. L. Criteria for Maintaining Balance of Program in County Health Departments. Pub. Health Rep., 46, 19: 1079 (May 8), 1931.

Toys for Toddlers—Ask of each toy: what can the child do or make with it? Is it suited to the preschool age? Good toys are fraught with the highest educational possibilities.

ROBINSON, M. H. Educational Play Materials for the Preschool Child. Pub. Health Nurse, 23, 5: 219 (May), 1931.

Chance of Brucella Abortus Infection—In Denmark 272 persons working with cattle were tested for *Br. abortus;* 94 per cent of a group of veterinarians in rural practice reacted positively. Other groups responded in proportion to the exposure to sick cattle. Milk had no proved connection with the reactions.

THOMSEN, A. Correlation of Occupation with Serologic Reactions for *Brucella abortus.* J. Infect. Dis., 48, 5: 484 (May), 1931.

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TOYODA, T., *et al.* Scarlet Fever. Am. J. Dis. Child., 41, 5: 1009 (May), 1931.

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WILLIAMS, C. L. Fumigants. Pub. Health Rep., 46, 18: 1013 (May 1), 1931.

Tuberculosis Case-Finding—Reviewing the 7-year record of the Chadwick clinics in Massachusetts, the author concludes that nothing really new has been learned, but what is shown (and most graphically, too) is that a comprehensive control program is badly needed if youth is to be saved from tuberculosis. A paper all should read and ponder over.

ZACKS, D. What We Have Learned from the Ten-Year Program in Massachusetts. New England J. Med., 204, 20: 1037 (May 14), 1931.

NEWS FROM THE FIELD

NEW SURGEON GENERAL FOR U. S. ARMY

DR. ROBERT U. PATTERSON has been appointed Surgeon General of the United States Army by President Hoover, with the rank of Major General, succeeding Dr. Merritte W. Ireland.

SICKNESS AMONG INDUSTRIAL EMPLOYEES

ACCORDING to the U. S. Public Health Service, a favorable health record among industrial workers during the second half of 1930 is indicated from reports of a group of industrial sick benefit associations covering about 135,000 male industrial employees.

RESEARCH FUNDS

THE Elizabeth Thompson Science Fund of Harvard University and the Sugar Institute are the latest donors of research funds to Dr. Harry J. Deuel, Professor of Biochemistry in the School of Medicine, University of Southern California. Previously the National Research Council and the Committee on Scientific Research of the American Medical Association made grants to him.

The funds are being used by Dr. Deuel to further his research in the antiketogenic value of carbohydrates. He had for his purpose the determination of the power of various sugars to reduce acidosis produced in individuals by a uniformly protein-fat diet.

SOCIAL HYGIENE

THE Massachusetts Society for Social Hygiene announces a competition, with a prize of $500, for a suitable manuscript on the subject of sex hygiene for adolescent boys and girls. The contest will close October 1, 1931, and the prize will be awarded January 1, 1932. Further particulars may be obtained from the Massachusetts Society for Social Hygiene, 1150 Little Building, Boston, Mass.

AMERICAN COLLEGE OF PHYSICIANS

THE American College of Physicians will hold its Sixteenth Annual Clinical Session at San Francisco with headquarters at the Palace Hotel, April 4–8, 1932. Following the Clinical Session, a large percentage of the attendants will proceed to Los Angeles where a program principally of entertainment will be furnished April 9, 10 and 11.

E. R. Loveland, Executive Secretary, 133–135 S. 36th Street, Philadelphia, Pa., is in charge of general and business arrangements, and may be addressed concerning any feature of the forthcoming Session.

ADVANCEMENT OF SCIENCE CENTENARY

THE British Association for the Advancement of Science will celebrate its centenary with a meeting in London, September 23–30, 1931. Particulars may be obtained on application to the Secretary, British Association, Burlington House, London, W.I.

NEW CRIPPLED CHILDREN'S HOSPITAL

A NEW $300,000 Wisconsin Orthopedic Hospital at Madison, Wis., is to be opened early this summer, according to a report from Wisconsin. It will have a solarium, open sun porch, playroom, and rooms for occupational therapy. One of the most sensible ideas carried out in this hospital is the reservation of the ground floor for patients who are able to get out of doors.

The building has a capacity of 113 beds, which will make hospital care available to many crippled children for whom facilities heretofore have been lacking.—U. S. Children's Bureau, Washington, D. C.

TEXAS SANITARIANS TO MEET

THE Ninth Texas Sanitarians' Short School will be held at Houston, with headquarters at the Rice Hotel, November 9–14, 1931, under the auspices of the Texas Public Health Association, with the Texas State Department of Health and the City of Houston cooperating.

The Short School will be conducted as two sessions this year, Laboratory and General, intended to embrace the general phases of public health activities such as nursing and welfare, food protection, laboratory control, and milk sanitation. Special attention is expected to be devoted to those attendants desiring instruction in laboratory work either for milk, sewage or water analysis.

AUXILIARY WATER SUPPLIES IN DROUGHT AREA

THE 1930 Annual Report of the Division of Sanitation of the State of New York brings out the striking fact that although many communities were obliged to resort to polluted auxiliary water supplies during the drought last year, not a single outbreak of waterborne disease resulted from their use. This was doubtless due to the prompt reporting by communities of intention to use auxiliary supplies and the installation by the division of emergency apparatus for the sterilization of the water. The work of supervising public water supplies increased considerably, owing to the drought and a total of 579 inspections was made, over 150 more than in 1929.—*Health News*, May 11, 1931, New York State Dept. of Health, Albany, N. Y.

CONNECTICUT CHILD-WELFARE COMMISSION

A NEW child-welfare commission has been recently appointed in Connecticut to study the child welfare progress made in the state since the recommendations of the commission of 1921 brought about sweeping changes in methods of child care. These resulted in the establishment of the bureau of child welfare, the juvenile court, and the department of special education in the public schools. The new commission, which serves without compensation, has been requested to present its report, including legislative recommendations, to the legislature convening in January, 1933.—U. S. Children's Bureau, Washington, D. C.

HEALTH FILMS BY TELEVISION

THE first known attempt in history to send health films by television was made by the New York State Department of Health over station W2XCD, Passaic, N. J., March 30, 1931.

PENNSYLVANIA SEWAGE ASSOCIATION CONFERENCE

THE Fifth Annual Conference of the Pennsylvania Sewage Association was held at State College, Pa., June 23 and 24. Among the speakers were: Frank E. Daniels, Harrisburg; Harry Krum, Allentown; Albert H. Mainwaring, Philadelphia; Roy L. Phillips, Meadville; C. F. Wertz, Philadelphia; Grant M. Olewieler, Montgomery County; Elton D. Walker, State College; F. S. Barckhoff, Salem, O.; John R. Downes, Plainfield, N. J.; and H. W. Streeter, Cincinnati, O.

THE HEALTH EDUCATION COUNCIL CONFERENCE

THE sixth annual conference of the Health Education Council was held at the Massachusetts Institute of Technology on June 5 and 6.

Dr. S. C. Prescott, head of the department of biology and public health at Massachusetts Institute of Technology, delivered the address of welcome at the opening session. In connection with the meeting there was a comprehensive health education exhibit.

The officers of the Health Education Council are: Clair E. Turner, honorary president; Ida M. Lewis, president, Brookline; Mabel E. Turner, vice-president, Lowell; and Adelaide R. Ross, secretary-treasurer, Malden.

RUSSELL SAGE FOUNDATION

JOHN M. GLENN, general director of the Russell Sage Foundation since its inception 24 years ago, has resigned that post, but will continue to serve as one of the trustees of the Foundation. Shelby M. Harrison, director of the Department of Surveys and Exhibits of the Russell Sage Foundation since 1912 and vice-general director in recent years, will succeed Mr. Glenn as general director on September 1, 1931.

While not primarily interested in public health the Foundation under Mr. Glenn's leadership has frequently concerned itself with the health aspects of social problems. The early educational efforts of the tuberculosis movement were largely made possible by the Foundation. Movements have been fostered or studies made in such fields as the prevention of blindness, industrial accidents, work fatigue, housing conditions.

Mr. Harrison has been with the Foundation for 19 years, as director of the Department of Surveys and Exhibits, and for several years as vice-general director has been closely associated with its general management.

No change in Foundation policies is expected.

PERSONALS

FLOYD C. MILLER, of Athens, Greene County, N. Y., has been appointed a member of the Advisory Committee on Milk Sanitation of the State Department of Health.

WILLIAM L. KELLER, M.D., Colonel, Medical Corps, chief of surgical service, Walter Reed General Hospital, Washington, D. C., was the recipient of the honorary degree of Doctor of Science at the commencement exercises of the Medical College of Virginia, Richmond, closing the ninety-third session of the institution on June 2.

DR. MORTON W. BLAND, Health Commissioner of Logan and Hocking Counties, O., died April 21, at the Harding Rural Rest Home, Worthington, O.

DR. HENRY FAIRCHILD OSBORN, who on January 1, 1933, will conclude 25 years as president of the American Museum of Natural History, New York, will relinquish his duties at that time. This was made known in the 62d annual report of the president and trustees of the museum.

RICHARD A. BOLT, M.D., Director of the Cleveland Child Health Association, will spend the summer in California. From June 22 to August 1 he is giving two courses in the summer session of the University of California at Los Angeles. One of the courses will take up elementary epidemiology and the other will deal with the field of public health in the United States.

HERMAN N. BUNDESEN, M.D., Fellow of the A. P. H. A., and President in 1928, has again been appointed to the position of Commissioner of Health of Chicago, which he held from February, 1922, to January, 1928. He has recently been Coroner for Chicago.

ENNION G. WILLIAMS, M.D., Virginia State Health Commissioner since 1908, died June 6. He was the oldest state health officer in length of service in the United States, though only 57 years of age. Dr. Williams was a member of the faculty of the Medical College of Virginia. He has been a member of the A. P. H. A. since 1905.

CONFERENCES

July 26–31, Third Congress of the Pan American Medical Association, held under the auspices of the Mexican Government, City of Mexico, Mexico.

July 27–August 2, The World Federation of Education Associations, Denver, Colo.

September 14–17, Sixtieth Annual Meeting, American Public Health Association, Montreal, Canada.

September 23–30, Centenary Meeting of the British Association for the Advancement of Science, London.

October 12–16, Nineteenth Annual Safety Congress and Exposition, Chicago, Ill.

November 9–14, the Ninth Texas Sanitarians' Short School, Houston, Tex.

July, 1932, The Second International Conference of Social Work, Frankfurt, Germany.

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